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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT): Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.

Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Compulsory Counterclaims in Trademark Opposition and Cancellation Proceedings

[37 CFR Part 2]

Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed rulemaking.

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice to make it compulsory to file a counterclaim for the cancellation of the registration pleaded by an opposer in an opposition proceeding or a petitioner in a cancellation proceeding when the grounds for such counterclaim exist at the time the answer is filed. Under present rules, a counterclaim for cancellation is not a compulsory counterclaim. By making counterclaim compulsory all potential claims between the parties involving the marks actually or potentially in issue are settled in one proceeding.

DATE: Comments must be received on or before May 15, 1979.

ADDRESSES: Comments may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. All comments received will be available for public inspection in Room 11 E 10, Crystal Plaza, Building 3, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: David J. Kera, Patent and Trademark Office (703-557-3551).

SUPPLEMENTARY INFORMATION: These amendments provide that if, in a trademark opposition or cancellation proceeding, the defendant (applicant in an opposition proceeding or respondent in a cancellation proceeding) has grounds for petitioning to cancel any of the registration of which ownership is pleaded by the plaintiff (opposer in an opposition proceeding or petitioner in a cancellation proceeding), the petition to cancel the plaintiff's registration or registrations shall be a compulsory counterclaim. The effect of the amendment of the rules will be that, if the counterclaim is not filed as provided by the rules, the defendant will thereafter be barred from petitioning to cancel the registration or registrations pleaded by the plaintiff in the prior proceeding on any ground that existed at the time when the answer was filed.

Since the decision in *Outdoor Sports Industries, Inc.* v. *Joseph & Feiss Company*, 177 USPQ 535 (TTAB, 1973), petition denied, 177 USPQ 533 (Comr., 1973), the Trademark Trial and Appeal Board consistently held that an attack upon the validity of a plaintiff's registration was a compulsory counterclaim. See: *Textron, Inc.* v. *The Gillette Company*, 180 USPQ 152 (TTAB, 1973); *Kajita* v. *Walter Kidde & Company*, 185 USPQ 436 (TTAB, 1975); *Delta Tire Corporation* v. *Sports Car Club of America, Incorporated*, 185 USPQ 443 (TTAB, 1975); *Scovill Manufacturing Company* v. *Stocko Metallwarenfabriken Henkels und Sohn KG*, 188 USPQ 24 (TTAB, 1975); *Endo Laboratories Inc.* v. *Fredericks*, 197 USPQ 560 (TTAB, 1977). Such counterclaim must be a petition for cancellation of the plaintiff's registration. See §§ 2.106(b), 2.114(b).

However, the Court of Customs and Patent Appeals, in *Thuron Industries, Inc.* v. *The Conard-Pyle Company*, 198 USPQ 403 (1978), held that, under the present rules in 37 CFR Part 2 and Rule 13, FRCP, a counterclaim for cancellation of a plaintiff's registration is not a compulsory counterclaim. The court reasoned that the present rule, 37 CFR 2.106(b), uses the permissive word "may" but not a mandatory word, such as "shall" or "must," so that the present rule makes a counterclaim permissive but not compulsory. The court also indicated that Rule 13(a), FRCP, does not support the position that a counterclaim for cancellation of a registration pleaded by a plaintiff is compulsory because the grounds for cancellation do not arise out of the transaction or occurrence that is the subject matter of the opposing party's claim.

Finally, the court expressed concern that a practice of making counterclaims compulsory might preclude a party, in certain circumstances, from filing a concurrent use application.

It was the Board's experience in the five years after *Outdoor Sports Industries, Inc.* v. *Joseph & Feiss Company, supra*, that the compulsory counterclaim practice in opposition and cancellation proceedings had a salutary effect in avoiding piecemeal litigation of a multiplicity of actions and counteractions. The question of the registrability of the defendant's mark is intimately related to the question whether the plaintiff's mark should remain on the register or should be cancelled. Whether considered as a matter of damage to the plaintiff or the proscription of section 2(d) of the act, a registration pleaded by the plaintiff is a premise upon which the complaint is based and the continued validity of a pleaded registration, when it is or may be challenged, must be decided as a prerequisite to a final determination of the registrability of the defendant's mark. All potential claims between the parties involving the marks actually or potentially in issue are settled in one proceeding. Discovery and trial on all of the issues are expedited and duplication of effort is avoided. Briefs and arguments on the issues are presented once and not several times. The parties are saved time and expense and the Board conserves its resources of personnel and time. The determination whether the plaintiff is entitled to retain its registration can be made before the issue of the registrability of the defendant's mark is decided. See: *King Candy Company* v. *Eunice King's Kitchen, Inc.*, 182 USPQ 108 (CCPA, 1974) [registered mark of even a subsequent-user opposer must be considered in an opposition]; *cf. Morehouse Manufacturing Corporation* v. *J. Strickland and Company*, 160 USPQ 715 (CCPA, 1969).

It has never been, and is not now, the Board's position that a concurrent use application is a compulsory counterclaim or even, properly speaking, a counterclaim of any kind to an opposition or petition for cancellation. This proposed amendment, if adopted, will not affect in any manner the practice of permitting the parties to an opposition proceeding, if they so agree, to have their respective rights adjudicated, when the statutory requirements can be fulfilled, in a concurrent use proceeding. See: Tips From the TTAB, The Concurrent User as Opposer, Vol. 67 Trademark Reporter, No. 6, page 654 (November-December, 1977).

In accordance with § 2.116(a), this proposed amendment, if adopted, will govern compulsory counterclaims in opposition and cancellation proceedings in lieu of Rule 13, FRCP.

In the usual situation contemplated by Rule 13, FRCP, both parties are presumably aware, when the complaint is filed, of the basic facts and circumstances surrounding the complaint. The defendant, as a result of this knowledge, is able to plead a counterclaim in the answer. However, in an opposition or cancellation proceeding before the Board, the applicant or respondent may know little or nothing about the registration upon which the opposer or petitioner is basing a claim of damage. The facts which may be the basis for a counterclaim to cancel the registration pleaded by an opposer or petitioner may not emerge until after the answer is due. To accommodate the special conditions of a proceeding before the Board as compared to litigation in a court, a rule on counterclaims is being proposed.

Notice is hereby given that pursuant to the authority contained in Section 41 of the Act of July 5, 1946, as amended (60 Stat. 427, 88 Stat. 1949, 15 U.S.C. 1123, as amended) and section 6 of the Act of July 19, 1952, as amended (85 Stat. 364, 88 Stat. 1949, 35 U.S.C. 6, as amended), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 2.106 and 2.114.

It is proposed to revise the sections as follows (additions are indicated by arrows; deletions are bracketed):

1. By revising § 2.106(b) to read as follows:

§ 2.106 *Answer.*

* * * * *

(b) ►(1)◄ An answer may contain any defense, [and it may also contain a request for affirmative relief by way of cancellation of a registration pleaded in the opposition; but no defense attacking the validity of such registration may be otherwise raised in the proceeding. Such request for affirmative relief must be verified or include a declaration in accordance with § 2.20 and must be accompanied by the fee as required by section 14 of the act. A reply to such request for affirmative relief is required within twenty days after service thereof; but no other reply to the answer need be filed.] ►including the affirmative defenses of unclean hands, laches, estoppel, acquiescense, fraud, mistake, or prior judgment. When pleading special matters, the Federal Rules of Civil Procedure shall be followed. A reply to an affimative defense need not be filed. When a defense attacks the validity of a registration pleaded in the opposition, paragraph (b)(2) of this section shall govern.

(b)(2)(i) A defense attacking the validity of any one or more of the registrations pleaded in the opposition shall be a compulsory counterclaim if grounds for such counterclaim exist at the time when the answer is filed. If grounds for a counterclaim are known to the applicant when the answer to the opposition is filed, the counterclaim shall be pleaded with or as part of the answer. If grounds for a counterclaim are learned during the course of the opposition proceeding, the counterclaim shall be pleaded promptly after the grounds therefor are learned. A counterclaim need not be filed if it is the subject of another proceeding.

(ii) An attack on the validity of a registration pleaded by an opposer will not be heard unless a counterclaim or separate proceeding is filed to seek the cancellation of such registration.

(iii) The provisions of §§ 2.111 through 2.115, inclusive, shall be applicable to counterclaims. A time, not less than thirty days, will be designated within which an answer to the counterclaim must be filed.

(iv) The times for pleading, discovery, testimony, briefs or oral argument will be reset or extended when necessary, upon motion by a party, to enable a party fully to present or meet a counterclaim or separate petition for cancellation of a registration.◄

* * * * *

2. By revising § 2.114(b) to read as follows:

§ 2.114 *Answer.*

* * * * *

(b) ►(1)◄ An answer may contain any defense, [and it may also contain a request for affirmative relief by way of cancellation of a registration pleaded in the petition; but no defense attacking the validity of such registration may be otherwise raised in the proceeding. Such request for affirmative relief must be verified, or include a declaration in accordance with § 2.20, and must be accompanied by the fee as required by section 14 of the act. A reply to such request for affirmative relief is required within twenty days after service thereof but no other reply to the answer need be filed.] ►including the affirmative defenses of unclean hands, laches, estoppel, acquiescence, fraud, mistake, or prior judgement. When pleading special matters, the Federal Rules of Civil Procedure shall be followed. A reply to an affirmative defense need not be filed. When a defense attacks the validity of a registration pleaded in the petition, paragraph (b)(2) of this section shall govern.

(b)(2)(i) A defense attacking the validity of any one or more of the registrations pleaded in the petition shall be a compulsory counterclaim if grounds for such counterclaim exist at the time when the answer is filed. If grounds for a counterclaim are known to respondent when the answer to the petition is filed, the counterclaim shall be pleaded with or as part of the answer. If grounds for a counterclaim are learned during the course of the cancellation proceeding, the counterclaim shall be pleaded promptly after the grounds therefor are learned. A counterclaim need not be filed if it is the subject of another proceeding.

(ii) An attack on the validity of a registration pleaded by a petitioner for cancellation will not be heard unless a counterclaim or separate proceeding is filed to seek the cancellation of such registration.

(iii) The provisions of §§ 2.111 through 2.115, inclusive, shall be applicable to counterclaims. A time, not less than thirty days, will be designated within which an answer to the counterclaim must be filed.

(iv) The times for pleading, discovery, testimony, briefs, or oral argument will be reset or extended when necessary, upon motion by a party to enable a party fully to present or meet a counterclaim or separate petition for cancellation of a registration.◄

* * * * *

Dated: February 28, 1979.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

[FR Doc. 79-8026; Filed 3-15-79; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,887,863, Re. S.N. 008,775, Filed Feb. 2, 1979, Cl. 323/19, SOLID-STATE REGULATED VOLTAGE SUPPLY, Adrian Paul Brokaw, Owner of Record: *Analog Devices, Incorporated, Norwood, Mass.*, Attorney or Agent: Howard M. Bollinger, et al., Ex. Gp.: 212

4,007,844, Re. S.N. 010,616, Filed Feb. 9, 1979, Cl. 214/75, SELF-FOLDING PLATFORM, William V. Perkins, Owner of Record: *Maxon Industries, Inc., Huntington Park, Calif.*, Attorney or Agent: Frederick E. Mueller, Ex. Gp.: 314

4,037,947, Re. S.N. 009,792, Filed Feb. 6, 1979, Cl. 325/27, FILM-TRANSPORT CONTROL FOR SOUND FILM CAMERA, Otto Freudenschuss, et al., Owner of Record: *Karl Vockenhuber; Raimund Hauser, both of Vienna, Austria*, Attorney or Agent: Ernest G. Montague, et al., Ex. Gp.: 211

4,078,096, Re. S.N. 010,657, Filed Feb. 9, 1979, Cl. 427/98, METHOD OF MAKING SENSITIZED POLYIMIDE POLYMERS, HAVING CATALYST AND ELECTROLESS METAL, METAL DEPOSITS THEREON AND CIRCUIT PATTERNS OF VARIOUS METALLIZATION SCHEMES, John Peter Redmond, et al., Owner of Record: *Inventors*, Attorney or Agent: William J. Keating, et al., Ex. Gp.: 162

4,117,030, Re. S.N. 006,311, Filed Jan. 24, 1979, Cl. 260/837 R, VINYL ESTER RESIN COMPOSITIONS CONTAINING DICYCLOPENTADIENE ALKENOATE, Donald Louis Nelson, Owner of Record: *The Dow Chemical Company, Midland, Mich.*, Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 142

PATENT NOTICES

Certificates of Correction for the Week of Apr. 24, 1979

Re. 29,367	4,102,773	4,115,948	4,128,799
Re. 29,782	4,102,847	4,116,554	4,129,149
Re. 29,848	4,103,814	4,116,771	4,129,225
D. 249,165	4,104,236	4,117,081	4,129,444
D. 250,943	4,104,287	4,117,260	4,129,490
3,813,400	4,104,594	4,117,363	4,129,505
3,843,883	4,104,717	4,117,416	4,129,546
3,957,741	4,104,878	4,117,810	4,129,571
3,974,797	4,105,424	4,118,098	4,129,728
3,980,768	4,105,855	4,118,280	4,129,850
3,987,652	4,106,007	4,118,469	4,130,130
4,008,190	4,106,510	4,118,704	4,130,171
4,015,242	4,106,889	4,118,942	4,130,182
4,019,301	4,107,076	4,119,586	4,130,347
4,025,893	4,107,094	4,119,628	4,130,530
4,032,519	4,107,171	4,119,712	4,130,583
4,034,092	4,107,232	4,119,780	4,130,799
4,035,514	4,107,600	4,119,815	4,130,930
4,042,889	4,107,633	4,119,963	4,130,968
4,043,896	4,107,704	4,120,174	4,130,984
4,044,121	4,108,008	4,120,184	4,131,022
4,045,199	4,108,064	4,120,290	4,131,025
4,046,794	4,108,526	4,120,655	4,131,801
4,047,659	4,108,596	4,120,862	4,131,995
4,050,983	4,108,785	4,120,946	4,132,018
4,055,562	4,109,192	4,121,164	4,132,128
4,058,506	4,109,243	4,121,178	4,132,276
4,060,522	4,109,647	4,121,317	4,132,344
4,060,970	4,109,882	4,121,569	4,132,376
4,061,726	4,110,233	4,122,072	4,132,572
4,064,124	4,110,402	4,122,111	4,132,626
4,066,558	4,110,452	4,122,378	4,132,837
4,067,596	4,110,513	4,122,786	4,132,943
4,077,758	4,110,617	4,122,858	4,132,975
4,079,113	4,110,832	4,122,950	4,133,315
4,082,563	4,110,871	4,123,274	4,133,580
4,083,612	4,110,878	4,123,474	4,133,583
4,083,962	4,110,934	4,123,508	4,133,637
4,084,608	4,111,019	4,124,870	4,133,713
4,087,460	4,111,037	4,125,420	4,133,727
4,091,096	4,111,401	4,125,648	4,133,811
4,093,462	4,111,438	4,126,009	4,134,031
4,093,919	4,111,528	4,126,386	4,134,075
4,096,152	4,111,792	4,126,644	4,134,124
4,096,945	4,111,882	4,126,832	4,134,143
4,097,370	4,112,057	4,127,001	4,134,604
4,097,677	4,112,150	4,127,113	4,135,032
4,097,965	4,112,171	4,127,425	4,135,329
4,098,876	4,112,208	4,127,725	4,135,919
4,099,531	4,113,241	4,127,726	4,136,049
4,100,190	4,113,965	4,127,804	4,136,083
4,100,617	4,113,990	4,127,876	4,136,094
4,101,522	4,114,116	4,127,944	4,136,220
4,101,764	4,114,225	4,128,004	4,136,907
4,102,552	4,114,493	4,128,106	4,136,968
4,102,559	4,115,166	4,128,233	4,137,311
4,102,591	4,115,290	4,128,345	4,137,496
4,102,618	4,115,299	4,128,592	4,138,447
4,102,661	4,115,630	4,128,644	
4,102,715	4,115,688	4,128,709	

Notice of Proposed Removal From Register

Pursuant to the provisions of 37 C.F.R. 1.347, a letter was directed on March 19, 1979, to Mr. Alan McCartney at 610 Fenton Building, Jamestown, N.Y. 14737, the last post office address furnished by him to the Committee on Enrollment. The letter was returned by the Post Office marked "Moved, not forwardable."

Mr. McCartney is being given thirty days from the date of this notice to inform the Patent & Trademark Office Committee on Enrollment whether he desires to remain on the register.

Failure to comply fully with this request within the 30-day period will result in the removal of his name from the register of attorneys.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Mar. 28, 1979.

Disclaimers

Design No. 248,350.—*Leif Blodee,* Holland, Mich. FURNITURE LEG POST. Patent dated July 4, 1978. Disclaimer filed Nov. 13, 1978, by the assignee, *The Gunlocke Company, Inc.*

The term of this patent subsequent to Sept. 20, 1990, has been disclaimed.

3,776,715.—*Robert J. Theissen,* Westfield, N.J. HALOPHENOXY BENZOIC ACID HERBICIDES. Patent dated Dec. 4, 1973. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,812,184.—*Robert J. Theissen,* Westfield, N.J. 2-NITRO-5-(HALOPHENOXY) BENZOYL CHLORIDES. Patent dated May 21, 1974. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,839,444.—*Robert J. Theissen,* Westfield, N.J. HALOPHENOXY BENZAMIDE HERBICIDES. Patent dated Oct. 1, 1974. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,873,302.—*Robert J. Theissen,* Westfield, N.J. HERBICIDAL USE AND COMPOSITION OF HALOPHENOXY BENZOIC CHLORIDES. Patent dated Mar. 25, 1975. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,873,303.—*Robert J. Theissen,* Westfield, N.J. HERBICIDAL USE AND COMPOSITIONS OF HALOPHENOXY BENZAMIDES. Patent dated Mar. 25, 1975. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,907,866.—*Robert J. Theissen,* Westfield, N.J. HIGHER HALOPHENOXY BENZOIC ACID ESTERS. Patent dated Sept. 23, 1975. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,908,878.—*Josef Blum,* Norwalk, Conn. APPARATUS FOR PRODUCING GLASS KNIVES FOR MICROTOMES AND THE LIKE. Patent dated Sept. 30, 1975. Disclaimer filed Feb. 13, 1979, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to the remaining term of said patent.

3,910,475.—*Arnold L. Pundsack,* Rochester and *Jerome N. Harris,* Webster, N.Y. SYSTEM FOR ELECTRICALLY GROUNDING OR BIASING A MEMBER. Patent dated Oct. 7, 1975. Disclaimer filed Feb. 26, 1979, by the assignee, *Xerox Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,929,455.—*Robert J. Theissen,* Westfield, N.J. HERBICIDAL HALOPHENOXY BENZOIC ACID SALTS. Patent dated Dec. 30, 1975. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,936,725.—*Herbert Anton Schneider,* Boulder, Colo. CURRENT MIRRORS. Patent dated Feb. 3, 1976. Disclaimer filed Feb. 22, 1979, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 2, 5 and 6 of said patent.

3,941,830.—*Robert J. Theissen,* Westfield, N.J. SUBSTITUTED PHENOXYBENZOIC ACIDS AND ESTERS THEREOF. Patent dated Mar. 2, 1976. Disclaimer filed Feb. 9, 1979, by the assignee, *Mobil Oil Corporation.*

The term of this patent subsequent to Mar. 28, 1989, has been disclaimed.

3,980,249.—*McCleery B. Cunningham* and *Clement D. Le Hardy,* Hartsville, S.C. HIGH SPEED CARRIER WITH DECKLED UNDERPLY. Patent dated Sept. 14, 1976. Disclaimer filed Feb. 23, 1979, by the assignee, *Sonoco Products Company.*

Hereby enters this disclaimer to claim 3 of said patent.

4,047,575.—*Robert L. Wagner,* La Porte, Ind. FOLDUP IMPLEMENT WITH LIFT ARRANGEMENT FOR WING THEREOF. Patent dated Sept. 13, 1977. Disclaimer filed Jan. 31, 1979, by the assignee, *Allis-Chalmers Corporation.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 6 and 9 of said patent.

Patents Available for Licensing or Sale

D. 239,564. STRINGED MUSICAL INSTRUMENT. Lee Bevill, 5458 E. Mountain St., Stone Mountain, Ga. 30083.

3,097,285. THERMOSTAT TIMER DEVICE. Robert Page and Irving Page, Apt. 2E, 53 Vermilyea Ave., New York, N.Y. 10034.

3,483,660. CORN HARVESTER (CURVED AND STRAIGHT) BLADE GRINDING MACHINE. Charlie Harris, 801 Southwest St., Culpeper, Va. 22701.

3,840,948. EMBALMER'S INSTRUMENT. Lewis L. Winfrey, 119 W. Second St., Apt. #507, Xenia, Ohio 45385.

3,876,124. CONTACT LENS CATCHING MEANS. Theodore P. Avery. Correspondence to: Nathaniel A. Humphries, 1730 Rhode Island Ave., NW., Washington, D.C. 20036.

3,995,672. APPARATUS FOR AUTOMATIC WOOD-SPLITTING. Michael B. Binninger, 135 Rideout Way, Marysville, Calif. 95901.

4,027,395. APPARATUS FOR ALIGNMENT OF PLAID FABRIC ON A CUTTING TABLE. Peter J. Vlahakis, 802 West 181st St., New York, N.Y. 10033.

4,066,087. PEA SHELLING APPARATUS. Frederick L. Bergert, Crystal Square No. 5, 1755, Jefferson Davis Hwy., Arlington, Va. 22202.

4,071,004. ELECTRIC-STATIC FUEL MIXTURE SYSTEM. Neil Ostergaard, 1454 E. Gateway Circle #12, Fargo, N. Dak. 58103.

4,071,293. CONTACT LENS AND METHOD OF MAKING SAME. Correspondence to: Nathaniel A. Humphries, 1730 Rhode Island Ave., NW., Washington, D.C. 20036.

4,073,413. DISPENSING APPARATUS WITH SELF CONTAINED SPOUT. Herman L. Tabler, 313 Ellsworth Place, Oxon Hill, Md. 20021.

4,108,083. PORTABLE WRITING AND READING TABLE ASSEMBLY. Albert Espinosa, 838 Riverside Drive, New York, N.Y. 10032.

4,116,326. VIBRATING CONVEYOR BAR CLEANING SYSTEM. David B. Tuman, Route 2, Box 2432, Oroville, Calif. 95965.

4,121,061. TELEPHONE HOLDER. Robert G. Donaldson, 3101 N. Sheridan Road, Apt. 1204, Chicago, Ill. 60657.

4,124,214. METHOD AND APPARATUS FOR INTERPRETIVE GAME. Jesse A. Pavis, 35 Clark St., Brooklyn, N.Y. 11201.

4,126,330. ANTI-THEFT DEVICE FOR TRACTOR TRAILER RIG. William H. Poole, 1200 S. Willow St., Chattanooga, Tenn. 37404.

4,136,902. SHOWER SOAP RETRIEVER. Donald L. Leonard, P.O. Box 305, Cornell, Ill. 61319.

4,138,093. GUARD RAIL CELL. L. N. Meinzer, 4331 Sierra Madre Drive, Sacramento, Calif. 95825.

The following two patents are offered by Dr. William C. Baird, 401 Bosque St., Meridian, Tex. 76665.

3,921,074. SAFEGUARD SENTRY.

4,079,317. SAFEGUARD SENTRY.

Pitney-Bowes, Inc., announces that non-exclusive licenses under reasonable terms are available under the following U.S. Patents:

3,255,439. POSTAGE METERING SYSTEM.

3,428,948. POSTAGE METERING SYSTEM.

3,501,744. POSTAGE METERING SYSTEM HAVING SIGNAL CONDITIONING MEANS.

3,716,698. CONTROL AND RECORDING APPARATUS.

Please address inquiries to: Corporate Patent Counsel, Patent Dept., Pitney-Bowes, Inc., Walnut and Pacific Sts., Stamford, Conn. 06904.

The General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for licenses should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

3,881,088. FLOWING VAPOR HIGH POWER LASER.

3,882,426. INCREMENT VARYING MEANS FOR INCREMENTAL ENCODER AND DECODER.

3,882,458. VOICE OPERATED SWITCH INCLUDING APPARATUS FOR ESTABLISHING A VARIABLE THRESHOLD NOISE LEVEL.

3,883,861. DIGITAL DATA BASE GENERATOR.

3,885,980. FIRE RESISTANT COMPOSITION.

3,892,051. SIMULATED COLLIMATION OF COMPUTER GENERATED IMAGES.

4,109,706. THERMALLY CONDUCTIVE CERAMIC ATTACHMENT.

4,111,572. CERAMIC-METAL ASSEMBLY.

4,124,019. TUBULAR SOLAR COLLECTOR.

4,130,301. DOUBLE-WALLED WELL CASING STRUCTURE.

4,136,327. WELL SURVEY SYSTEM MODULATION TECHNIQUE.

Applications for license under the following patent should be addressed to: Patent Counsel, Drive Systems Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va. 24153.

4,074,339. METHOD AND APPARATUS FOR MEASURING THE SPEED OF A ROTATING SHAFT.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,116,363. SECURING MEANS FOR COOKING VESSELS.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Bldg. #500, Room 218, Schenectady, N.Y. 12345.

4,139,822. EDDY CURRENT PROBE FOR INSPECTING INTERIORS OF GAS TURBINES, SAID PROBE HAVING PIVOTAL ADJUSTMENTS AND A BORESCOPE.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,436,166. GAS BURNER WITH CAPTURED SHUTTER.

3,648,223. LOCK COLLAR FOR MULTIPLE ELECTRICAL TERMINAL CONNECTIONS.

3,995,584. PORTABLE ULTRASONIC SOLDERING POT.

3,996,762. AIR CONDITIONING SYSTEM FOR A MOBILE HOME INCLUDING COMPONENT AREA ACCESS.

4,003,214. AUTOMATIC ICE MAKER UTILIZING HEAT PIPE.

4,070,600. HIGH VOLTAGE DRIVER CIRCUIT.

4,088,017. CLOTHES DRYER AIR FLOW TEST DEVICE AND METHOD.

4,109,226. DISCONNECT SWITCH WITH RESET MECHANISM.

4,111,011. ADDITIVE DISPENSING SYSTEM.

4,112,767. CLOTHES DRYER VARIABLE SPEED DRIVE SYSTEM.

4,121,079. MINIMIZING LAMP FLICKER AND BLOWER SPEED VARIATION IN A MICROWAVE OVEN EMPLOYING DUTY CYCLE POWER LEVEL CONTROL.

4,137,514. CONTROL MECHANISM.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

Re. 29,885. HORIZONTAL DEFLECTION SYSTEM WITH BOOSTED B PLUS.

4,132,903. CCD OUTPUT CIRCUIT USING THIN FILM TRANSISTOR.

4,132,918. POLYCRYSTALLINE SELENIUM IMAGING DEVICES.

4,132,927. GATING SIGNAL GENERATOR FOR SWITCHED PINCUSHION CORRECTION CIRCUIT.

4,132,998. INSULATED GATE FIELD EFFECT TRANSISTOR HAVING A DEEP CHANNEL PORT MORE HIGHLY DOPED THAN THE SUBSTRATE.

4,133,002. PAL IDENTIFICATION CIRCUIT.

4,133,003. RASTER REGISTRATION SYSTEM FOR A TELEVISION CAMERA.

4,133,040. MULTI-FUNCTION LOGIC GATE WITH ONE GATE DELAY.

4,133,205. IDENTIFICATION OF ENGINE CYLINDER HAVING FAULT.

4,133,502. PLURAL PANELS DEPLOYED EFFECTIVELY AS A SINGLE PANEL.

4,133,540. RECORD HANDLING SYSTEM FOR A VIDEO DISC PLAYER.

4,133,925. PLANAR SILICON-ON-SAPPHIRE COMPOSITE.

4,134,028. CHARGE TRANSFER CIRCUITS WITH COMPENSATION FOR TRANSFER LOSSES.

4,134,031. CHARGE INJECTION DEVICES AND ARRAYS AND SYSTEMS INCLUDING SUCH DEVICES.

4,134,046. RETRACE BLANKING PULSE GENERATOR WITH DELAYED TRANSITION.

4,134,072. DIRECT DIGITAL FREQUENCY SYNTHESIZER.

4,134,082. RAMP GENERATOR FOR HARMONIC TUNED DEFLECTION.

4,134,128. TELEVISION PICTURE SIZE ALTERING APPARATUS.

4,134,131. DIGITAL VIDEO SYNCHRONIZER.

4,134,888. CHOLESTERYL CARBONATES AND CARBAMATES OF AZO DYES.

4,135,133. DUAL MODE FILTER.

4,135,200. BRIGHTNESS CONTROL CIRCUIT WITH PREDICTABLE BRIGHTNESS CONTROL RANGE.

4,136,300. CATHODE RAY TUBE HAVING IMPROVED SHADOW MASK.

4,136,353. BIPOLAR TRANSISTOR WITH HIGH-LOW EMITTER IMPURITY CONCENTRATION.

4,136,358. TRANSCODING APPARATUS.

4,136,399. DYNAMIC CHANNEL ALLOCATION BUFFER MATRIX.

4,136,940. RESIST DEVELOPMENT CONTROL SYSTEM.

4,137,077. BROADENING THE SPATIAL FREQUENCY PASS BAND OF A THERMOPLASTIC LAYER.

4,142,204. COLOR IMAGE STORAGE AND DISPLAY UTILIZING HOLOGRAPHY.

4,142,209. DISC TRACK SERVO SYSTEM.

Re. 29,910. CURRENT MIRROR AMPLIFIER.

4,138,595. IDLE-BUSY SIGNALLING BETWEEN TELEPHONE SYSTEM AND RADIOPHONE SYSTEM.

4,138,628. MAGNETIZING METHOD FOR USE WITH A CATHODE RAY TUBE.

4,138,647. MEMORY TYPE TUNING SYSTEM FOR STORING INFORMATION FOR A LIMITED NUMBER OF PREFERRED TUNING POSITIONS.

4,138,683. SHORT RADIATING HORN WITH AN S-SHAPED RADIATING ELEMENT.

4,138,703. VIDEO DISC PACKAGE.

4,138,741. DISC ECCENTRICITY COMPENSATING SYSTEM.

4,138,895. SWITCHABLE DEPTH OF FOCUS PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM.

4,138,998. INDICATING TEMPERATURE WITHIN LIVING TISSUE.

4,139,658. PROCESS FOR MANUFACTURING A RADIATION HARDENED OXIDE.

4,139,784. CCD INPUT CIRCUIT.

4,139,796. PHOTOCONDUCTOR FOR IMAGING DEVICES.

4,139,826. CRYSTAL OVERTONE OSCILLATOR USING CASCADE CONNECTED TRANSISTORS.

4,139,851. TWO LEVEL THRESHOLD CIRCUIT.

4,139,858. SOLAR CELL WITH A GALLIUM NITRIDE ELECTRODE.

4,139,900. GROUND STATION DATA STORAGE SYSTEM.

4,140,923. CHARGE TRANSFER OUTPUT CIRCUIT.

4,140,977. SIGNAL TRANSLATION CIRCUITS.

4,141,028. CONTACT CLIP.

4,141,040. VIDEO SIGNAL AMPLITUDE REGISTRATION SYSTEM.

4,141,456. APPARATUS AND METHOD FOR ALIGNING WAFERS.

4,141,627. ELECTRO-OPTIC DEVICE.

4,141,780. OPTICALLY MONITORING THE THICKNESS OF A DEPOSITING LAYER.

4,142,123. IMAGE DISPLAY DEVICE WITH OPTICAL FEEDBACK TO CATHODE.

4,142,163. SURFACE ACOUSTIC WAVE DEVICE WITH REDUCED SPURIOUS RESPONSES.

4,142,195. SCHOTTKY BARRIER SEMICONDUCTOR DEVICE AND METHOD OF MAKING SAME.

4,142,197. DRAIN EXTENSIONS FOR CLOSED COS/MOS LOGIC DEVICES.

4,115,720. DEVICE HAVING THERMIONIC CATHODE HEATED BY FIELD-EMITTED ELECTRONS.

4,115,724. ELECTRON BEAM OSCILLATION COMPENSATION METHOD.

4,116,263. MOUNTING STRUCTURE.

4,116,526. DOUBLE MODULATION HOLOGRAPHIC RECORDING TECHNIQUE.

4,116,733. VAPOR PHASE GROWTH TECHNIQUE OF III-V COMPOUNDS UTILIZING A PREHEATING STEP.

4,117,301. METHOD OF MAKING A SUBMICROMETER APERTURE IN A SUBSTRATE.

4,117,350. SWITCHING CIRCUIT.

4,117,351. TRANSISTOR SWITCHING CIRCUIT.

4,117,368. MODULAR TYPE GUIDED BEAM FLAT DISPLAY DEVICE.

4,117,380. TRANSFORMER ARRANGEMENT FOR SYNCHRONOUSLY SWITCHED VERTICAL DEFLECTION SYSTEM.

4,117,415. BRIDGE AMPLIFIERS EMPLOYING COMPLEMENTARY TRANSISTORS.

4,117,416. CURRENT MIRROR AMPLIFIERS WITH PROGRAMMABLE CURRENT GAINS.

4,117,417. SWITCHABLE CURRENT AMPLIFIERS.

4,117,433. STATIC CONVERGENCE DEVICE INCLUDING MAGNETIC CORRECTOR APPARATUS.

4,117,506. AMORPHOUS SILICON PHOTOVOLTAIC DEVICE HAVING AN INSULATING LAYER.

4,112,325. ELECTRON DISCHARGE TUBE HAVING A CUP-SHAPED SECONDARY ELECTRON EMISSIVE ELECTRODE.

4,112,326. NON-UNIFORM DYNODE MESH FOR AN ELECTRON DISCHARGE TUBE.

4,112,457. PHOTOVOLTAIC DEVICE HAVING AN EXTENDED PN JUNCTION.

4,112,465. INRUSH CURRENT START-UP CIRCUIT FOR A TELEVISION RECEIVER INCLUDING A START-UP DECOUPLING CIRCUIT.

4,112,562. PROCESS OF FABRICATING A CATHODE RAY TUBE.

4,113,262. RECORD SUPPORT AND ALIGNMENT APPARATUS FOR A VIDEO DISC PLAYER.

4,113,514. METHOD OF PASSIVATING A SEMICONDUCTOR DEVICE BY TREATMENT WITH ATOMIC HYDROGEN.

4,113,516. METHOD OF FORMING A CURVED IMPLANTED REGION IN A SEMICONDUCTOR BODY.

4,113,524. METHOD OF ASSEMBLING COMPONENTS ON PRINTED CIRCUIT BOARD.

4,113,897. SMOOTH GROOVE FORMATION METHOD EMPLOYING SPIN COATING OF NEGATIVE REPLICA OF INSCRIBED DISC.

4,114,034. OPTICAL CURSOR TRACKING CORRECTION SYSTEM.

4,114,035. POSITION ENCODER EMPLOYING CHARGE TRANSFER CIRCUIT.

4,114,051. TRIGGERED BURST GENERATOR.

4,114,055. UNBALANCED SENSE CIRCUIT.

4,114,072. HIGH VOLTAGE PROTECTION CIRCUIT HAVING PREDICTABLE FIRING POINT.

5,114,089. GROUND FAULT DETECTING APPARATUS INCLUDING CURRENT - RESPONSIVE THRESHOLD DETECTION CIRCUITRY.

4,114,095. SOLID STATE OSCILLOSCOPE.

4,114,096. METHOD OF TESTING SEMICONDUCTOR DEVICES.

4,118,841. MAGNETIC TORQUING SYSTEM FOR CHANGING THE SPIN RATE OF AN ORBITING SATELLITE.

4,115,157. ORGANIC WELDING FLUX COMPOSITION.

4,115,707. CIRCUIT FOR SINGLE-LINE CONTROL OF GTO CONTROLLED RECTIFIER CONDUCTION.

4,115,708. FAST-SWITCHING PULSE MODULATOR.

4,115,719. ELECTRON MULTIPLIER WITH HIGH ENERGY ELECTRON FILTER.

4,137,478. COLOR FLAT PANEL TELEVISION.

4,137,485. IMAGE DISPLAY BLOCK SCANNING METHOD.

4,137,545. GATE TURN-OFF THYRISTOR WITH ANODE RECTIFYING CONTACT TO NON-REGENERATIVE SECTION.

4,137,548. METHOD AND APPARATUS FOR OPTIMIZING COLOR PURITY IN A COLOR KINESCOPE.

4,137,550. VIDEO DISC WITH A DIELECTRIC LAYER FORMED FROM ACETYLENE AND NITROGEN.

4,137,551. CATHODE ADDRESSING SYSTEM.

4,137,552. AUTOMATIC BEAM CURRENT LIMITER WITH INDEPENDENTLY DETERMINED THRESHOLD LEVEL AND DYNAMIC CONTROL RANGE.

National Technical Information Service

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The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

CHIEF, INTELLECTUAL PROPERTY DIVISION, OTJAG
Department of the Army, Room 2D 444, Pentagon
Washington, D.C. 20310

Patent application 773,563. Printed Circuit Traveling Wave Tube. Filed Mar. 2, 1977.

Patent application 895,421. High Voltage Nanosecond Pulser Using a Repetitive Series Interrupter. Filed Apr. 12, 1978.

Patent application 907,648. Short Circuit Protection of Regulated Power Supplies. Filed May 22, 1978.

Patent application 931,638. Analog-to-Digital Integrated Converter. Filed Aug. 7, 1978.

Patent application 932,729. Body Armor for Women. Filed Aug. 10, 1978.

Patent application 936,447. Sintered Polycrystalline Nitrogen Stabilized Cubic Aluminum Oxide Material. Filed Aug. 24, 1978.

Patent 4,083,048. Time Alignment Error Sensor System for Range Tracking. Filed Dec. 20, 1976. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,085,319. Spatial-Multiplex, Spatial-Diversity Optical Communication Scheme. Filed Feb. 1, 1977. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,087,750. Receiver for Detecting and Analyzing Amplitude or Angle Modulated Waves in the Presence of Interference. Filed May 23, 1968. Patented May 2, 1978. Not available NTIS.

Patent 4,096,283. Method of Compacting Freeze-Dried Particulate Foods. Filed Nov. 8, 1976. Patented June 20, 1978. Not available NTIS.

Patent 4,097,868. Antenna for Combined Surveillance and Foliage Penetration Radar. Filed Dec. 6, 1976. Patented June 27, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 946,003. Chemical Agent Injection System for Fire Fighting Equipment. Filed Sept. 27, 1978.

Patent application 947,379. Adiabatic Laser Calorimeter. Filed Oct. 2, 1978.

Patent application 954,031. Alkanediamide-Linked Polyphthalocyanines Coordinated With $SnCl_2$. Filed Oct. 23, 1978.

Patent application 954,377. An Improved Electrically Excited Mercury Halide Laser. Filed Oct. 24, 1978.

Patent 4,092,627. Calibration Circuit for Expendable Sonobuoys. Filed Dec. 30, 1976. Patented May 30, 1978. Not available NTIS.

Patent 4,103,849. Catapult Restraint/Release System. Filed Sept. 15, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,106,875. Explosively-Separated Tongue and Groove Joint. Filed Sept. 23, 1977. Patented Aug. 15, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters —NASA,
Code GP–2, Washington, D.C. 20546

Patent application 945,043. Time Delay and Integration Detectors Using Charge Transfer Devices. Filed Sept. 22, 1978.

Patent application 961,831. Portable Appliance Security Apparatus. Filed Nov. 17, 1978.

Patent application 966,549. A System for Concurrently Delivering a Stream of Powdered Fuel and a Stream of Powdered Oxidizer to a Combustion Chamber for a Reaction Motor. Filed Dec. 5, 1978.

Patent 4,106,218. Simulator Method and Apparatus for Practicing the Making of an Observer-Controlled Object With a Target. Filed Feb. 25, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,106,687. Totally Confined Explosive Welding. Filed Sept. 10, 1973. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,627. Stabilization of He^3(A 3 Sigma U^+) Molecules in Liquid Helium by Optical Pumping for Vacuum UV Laser 6. Filed Mar. 29, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,919. Heat Exchanger. Filed Mar. 19, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,108,241. Heat Exchanger and Method of Making. Filed Mar. 19, 1975. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,122,454. Conical Scan Tracking System Employing a Large Antenna. Filed July 25, 1977. Patented Oct. 24, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 10, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-7-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-15-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-23-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-28-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	10-12-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	10-26-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-26-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-26-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-1-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-2-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-18-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-1-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-17-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	11-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during March 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,023,412 to 3,027,557, inclusive
Plant Patents..... Numbers 2,133 to 2,134, inclusive

REISSUES

APRIL 24, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,972

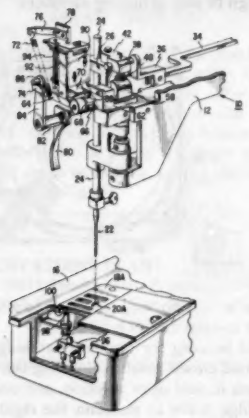
SAFETY LOCKOUT SYSTEM FOR SEWING MACHINES

John A. Herr, Garwood, and Oswald M. Porter, Livingston, both of N.J., assignors to The Singer Company, New York, N.Y.

Original No. 3,985,087, dated Oct. 12, 1976, Ser. No. 589,167, Jun. 23, 1975. Application for reissue Jan. 9, 1978, Ser. No. 868,006

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 R **20 Claims**



1. In a sewing machine having a frame, a needle bar disposed for endwise reciprocation in said frame, a needle bar jogging means for selectively initiating relative lateral movement of said needle bar for producing zig-zag stitches whereby the sewing machine is operable in straight stitch and zig-zag modes, a work engaging presser mechanism including control means for selectively lifting said presser mechanism away from a work engaging position and lowering said presser mechanism toward a work engaging position, and means operatively connecting said presser mechanism with said jogging means for disabling said jogging means *and for constraining said needle bar in a predetermined straight stitch position* in response to actuation of said presser mechanism control means.

Re. 29,973

INSTALLATION TOOL

Joseph R. Paradis, Wayland, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 4,047,545, dated Sep. 13, 1977, Ser. No. 780,724, Mar. 24, 1977. Continuation of Ser. No. 656,489, Feb. 9, 1976, abandoned. Application for reissue Aug. 21, 1978, Ser. No. 935,207

Int. Cl.[2] B21F *9/02*

U.S. Cl. 140—123.6 **18 Claims**

1. A tool for tensioning an item having a free end, comprising

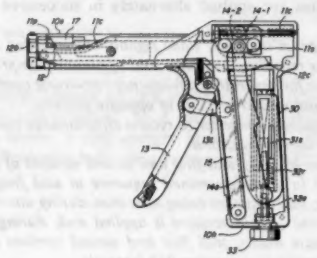
means for gripping and drawing the free end of the item;

means for severing an end portion of said item;

first and second pivotally connected links connected to the drawing means;

means for applying force to said drawing means through said first and second links to apply tension to the end of said item; and

means for maintaining said links in relative alignment until the applied force reaches a prescribed level whereupon



said links pivot out of alignment and operate the severing means.

Re. 29,974

SILVER SALT DIRECT POSITIVE EMULSION

Robert W. Berriman, Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,367,778, dated Feb. 6, 1968, Ser. No. 448,467, Apr. 15, 1965. Application for reissue May 6, 1977, Ser. No. 794,489

Int. Cl.[2] G03C *1/28*

U.S. Cl. 96—108 **6 Claims**

11. A light-sensitive photograhic direct positive emulsion containing grains comprising a central core of silver halide containing centers which are formed by treatment with a salt of a noble Group VIII metal and which promote the deposition of photolytic silver and an outer shell covering said core comprising a fogged silver halide that develops to silver without exposure.

Re. 29,975

MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM

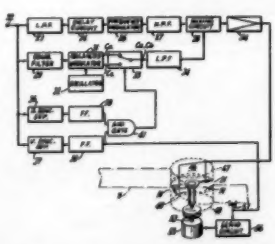
Yoshio Ishigaki, Tokyo; Hisaaki Narahara, Musashino, and Takao Tsuchiya, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Original No. 3,925,810, dated Dec. 9, 1975, Ser. No. 542,697, Jan. 21, 1975. Application for reissue Dec. 28, 1976, Ser. No. 754,982

Claims priority, application Japan, Jan. 21, 1974, 49-9160

Int. Cl.[2] H04N *5/78*

U.S. Cl. 358—4 **14 Claims**



1. Apparatus in which video signals are recorded in h-alignment in adjacent tracks on a recording medium, said apparatus comprising:

A. means for generating a frequency converting carrier signal in first and second versions of opposite polarity;

B. a frequency converter to receive chrominance components of said video signals; and

C. means to apply said first and second versions of said carrier signal in a predetermined sequence to said frequency converter, said sequence being such that, during alternate tracks, only one of said versions is applied and, during the remaining alternate tracks, said first and second versions are applied alternately in successive line intervals.

6. Apparatus in which video signals are recorded in adjacent tracks on a recording medium, said apparatus comprising:

A. means for generating a frequency converting carrier signal in first and second versions of opposite polarity;

B. a frequency converter to receive chrominance components of said video signals; and

C. means to apply said first and second versions of said carrier signal in a predetermined sequence to said frequency converter, said sequence being such that, during alternate tracks, only one of said versions is applied and, during remaining alternate tracks, said first and second versions are applied alternately in successive line intervals.

Re. 29,976

TAPE CARTRIDGE WHICH IS NORMALLY CLOSED BUT IS PIVOTED TO OPEN POSITION WHEN TAKEN INTO USE, AND TRANSPORT APPARATUS FOR SUCH A CARTRIDGE

Klaus Schoettle, Heidelberg; Heinrich Wittkamp, Mannheim; Karl Uhl, Frankenthal; Gerhard Rotter, Ludwigshafen, all of Fed. Rep. of Germany, and Robert Gertz, Laguna Hills, Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Original No. 3,987,489, dated Oct. 19, 1976, Ser. No. 533,177, Dec. 16, 1974. Application for reissue Dec. 30, 1977, Ser. No. 866,411

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1973, 2364397

Int. Cl.[2] G11B *23/08, 15/32*

U.S. Cl. 360—132 **11 Claims**

1. A tape cartridge assembly for use with a tape transport apparatus having a tape driving capstan, a spindle mounted for rotation and also for movement transversely to its axis towards said capstan, and cartridge receiving means provided with actuating members, said tape cartridge assembly comprising:

a housing of flat rectangular shape with lower, upper and side walls, at least said lower walls having an aperture therein,

a flangeless hub and

a roll of tape wound on said hub;

said hub having an opening which in the closed position of said cartridge is located for access, through said aperture, by said spindle when said cartridge is placed, in a direction generally axially of said hub, in a predetermined position on said cartridge receiving means;

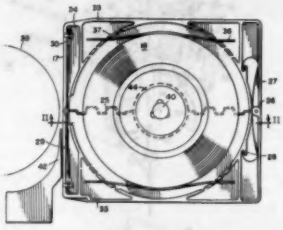
said housing being split into two parts of approximately equal size and having

means pivotally connecting said two parts to allow movement of said two parts between

a closed position in which said housing encloses said roll of tape, and

an open position in which at least a part of the peripheral surface of said roll of tape is exposed to permit engagement therewith of said tape driving capstan;

said housing parts having further apertures permitting entry therethrough of said actuating members;



spring means in said housing which urge said parts against each other toward closed position;

means in said housing for normally latching said parts together in said closed position, limiting the pivoting angle of said parts in said open position, and cooperating with said cartridge walls to maintain the rigidity of the cartridge in its closed and open positions, said latching means, upon engagement by said actuating members incident to said entry, unlatching the housing parts to permit said parts to be pivotally moved apart under the control of said cartridge receiving means and hence said roll of tape to be moved, in response to the transverse displacement of said spindle, towards said capstan for engagement therewith while said cartridge is retained by said receiving means in said predetermined position on said apparatus; and

holding means within said housing which in the closed position of the cartridge holds the roll of tape positioned for access by said spindle.

PLANT PATENTS

GRANTED APRIL 24, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,409

BIRCH TREE

Earl Cully, R.R. #5, Jacksonville, Ill. 62650

Filed Feb. 6, 1978, Ser. No. 875,381
Int. Cl.[2] A01H *5/12*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of birch tree substantially as herein shown and described, characterized by its rapid growth habit, its transitional stages of bark as to color and exfoliation continuously during the growing season with large sheets of flaking, the outer bark coloration being brown to tan and the inner bark creamy white to white, the larger size of the dark green leaves, the dense branching, and its ability to withstand wind and ice breakage.

4,410

IMPATIENS PLANT — OSAGE

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Jul. 3, 1978, Ser. No. 921,889
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant, as described and illustrated, known by the cultivar name OSAGE, and particularly characterized by a large orange flower, large variegated leaves, a stiff upright growth habit, and a more consistent flowering habit than Longwood's CAROUSEL.

4,411

AFRICAN VIOLET

Frank Jørgensen, 5494 Stige, Denmark

Filed Nov. 17, 1977, Ser. No. 853,144
Claims priority, application Denmark, Feb. 23, 1977, 805/77
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new variety of African violet plant, substantially as herein shown and described, characterized by the compact growth, the very filled intense violet upright flowers which rise upwardly in a central compact cluster above a circle of leaves having on the upper side a light central star-shaped spot and being supported by heavy peduncles increasing their diameter gradually towards the leaves.

PATENTS

GRANTED APR. 24, 1979

ERRATA

For CLASS	See PATENT NO.
428–288	4,150,674
414–011	4,150,755
414–040	4,150,756
414–107	4,150,757
414–282	4,150,758
414–187	4,150,759
271–065	4,150,835
358–285	4,150,873
546–257	4,151,165
562–504	4,151,199
260–029.6 RW	4,151,341
200–147 R	4,151,391
360–115	4,151,591

PATENTS

GRANTED APRIL 24, 1979

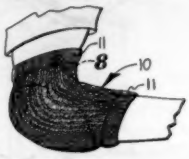
GENERAL AND MECHANICAL

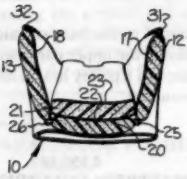
4,150,442

ELBOW OR HEEL PROTECTOR

Walter S. Boone, Valdese, N.C., assignor to Alba-Waldensian, Incorporated, Valdese, N.C.

Filed Jun. 12, 1978, Ser. No. 914,415
Int. Cl.[2] A41D *13/08*; A61B *19/00*
U.S. Cl. 2—16 **7 Claims**





1. An elbow or heel protector for providing cushioning to confined bed patients and the like, said protector comprising

(a) a tubular sleeve stretchable in both longitudinal and circumferential directions and being adapted to provide a snug fit over the arm or foot of the patient,

(b) pad means positioned within said sleeve to receive and cushion the patient's elbow or heel, said pad means being of substantially U-shaped transverse cross-sectional configuration in the central portion thereof and including

(1) opposite side panels of resilient foam material defining opposite sides of said U-shaped cross-sectional configuration, each of said side panels including an upper peripheral edge and a pair of converging lower edges extending from said upper peripheral edge,

(2) a pair of superpositioned substantially rectangular bottom panels of resilient foam material including opposite sides and opposite ends and defining the bottom of said U-shaped cross-sectional configuration,

(3) first seam means connecting together corresponding opposite ends of said superpositioned substantially rectangular bottom panels of resilient foam material, and

(4) second seam means connecting said lower edges of said opposite side panels to the corresponding opposite sides of the lowermost of said superpositioned substantially rectangular bottom panels of resiient foam material, the opposite sides of the uppermost of said substantially rectangular bottom panels of resilient foam material being free of connection to said side panels and covering said second seam means to prevent contact of the patient with said second seam means, and

(c) means securing said pad means in position within said sleeve.

4,150,443

ANTI-FOGGING SPORTS GOGGLE

Michael A. McNeilly, South of Ketchum, Id., assignor to Robert E. Smith, Ketchum, Id.

Filed Mar. 13, 1978, Ser. No. 885,965
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—436 **13 Claims**

1. An anti-fogging sports goggle comprising a lens structure sufficiently wide to span the eyes of the wearer, closure means in conjunction with said lens structure to position said lens structure a sufficient distance from the eyes of the wearer to permit the wearer to wear eyeglasses beneath the goggle in the air space between the lens structure and the face of the wearer, strap means to removably maintain the goggle in position on the wearer's head, and a motor and fan unit carried directly on and forming part of the goggle without projection exteriorly therefrom to forcibly circulate the moist warm air present in said air space over the glasses of the wearer and over the inner surface of said lens structure to preclude condensation build-up on said glasses and on said inner surface of said lens structure; said motor and fan unit being integral with said goggle and mounted directly thereon to preclude the entry of ambient air directly therethrough into said air space.

4,150,444

PROSTHETIC JOINT

Carl-Göran A. Hagert, Barnhemsgatan 37, 43131 Mölndal, Sweden

Filed Jun. 27, 1977, Ser. No. 810,210
Claims priority, application Sweden, Jun. 28, 1976, 7607345
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **18 Claims**

1. A prosthetic joint comprising a first and a second joint member angularly movable with respect to each other, each of said members being arranged to be attached to one of a pair of skeletal bones, in which said first joint member is a joint head having a base face for resting on a supporting surface provided on one of the skeletal bones, a convex slide face shaped as a part of a surface of revolution having an axis extending through the joint head at a distance from said flat face, and a

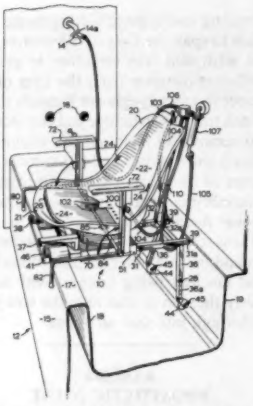
pair of opposed, flattened lateral guide faces provided each with a groove extending transversely of said base face and said axis of revolution, each of said grooves extending from an open end cutting into said base face to a closed end remote from said base face, said closed end having a spherically rounded, concave end wall, and in which said second joint member is a socket member comprising a bowl-shaped part having an outer top face for resting on a supporting surface provided on the other one of the pair of skeletal bones, a concave inner slide face forming part of a surface of revolution having a shape corresponding to the shape of the convex slide face of the joint head, stem portions attached to said bowl-shaped part and arranged to engage said opposed guide faces, and a pair of essentially hemispherical knobs supported by said stem portions, each of said knobs engaging one of said grooves into which it is admitted through the aforesaid open end of the groove.

4,150,445

SHOWER BATH CHAIR FOR USE IN CONJUNCTION WITH A BATH TUB

Bernard B. Bailey, 1247 Pharmacy Ave., Scarborough, Canada

Filed May 16, 1977, Ser. No. 797,259
Int. Cl.[2] A47K *3/12*
U.S. Cl. 4—185 S **18 Claims**



1. A shower chair assembly for use in combination with a bath tub comprising

a chair means;

a track means transversely supportable over said bath tub;

means for supporting said track means over said bath tub;

chair support means moveable lengthwise on said track means for supporting said chair on said track means;

said support means including vertical pivot means whereby said chair can rotate about a generally vertical axis

locking means for locking said chair adjacent at least one end of said track means to restrain said lengthwise movement;

and means for restraining said rotational movement.

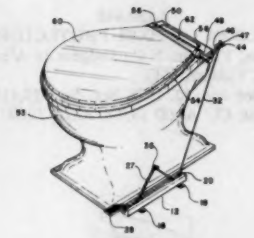
4,150,446

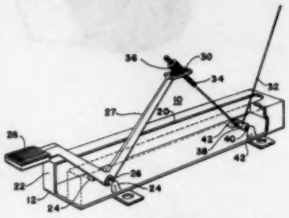
TOILET SEAT LIFTER

James E. Crocker, Rte. 3, Box 80, Windsor, Va. 23487

Filed Dec. 7, 1977, Ser. No. 858,256
Int. Cl.[2] A47K *3/10*
U.S. Cl. 4—251 **3 Claims**

1. In combination with a toilet bowl a toilet seat lifter comprising, a hinge secured thereto, a pin passing therethrough, a seat secured to said pin and movable therewith; a toilet cover hinged to said pin; a foot lever pivotally mounted at the base of said bowl; a cable connected to one end of said foot lever and extending upwardly to said pin and being secured to one end of a bracket fixed on one end of said pin whereby downward pressure on said foot lever lowers said bracket thereby turning said pin and raising said seat and said toilet cover, further including





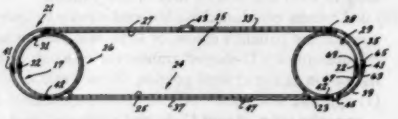
a housing secured at the base of said bowl and having an elongated slot in the upper part thereof receiving said foot lever therein; and a pulley in said housing, said cable being trained thereunder.

4,150,447

MATTRESS CONSTRUCTION

Curtis G. Miller, 2905 N. Bristol, Apt. L, Santa Ana, Calif. 92706

Filed May 27, 1977, Ser. No. 801,349
Int. Cl.[2] A47C *27/10*
U.S. Cl. 5—371 **16 Claims**



1. Mattress comprising:

a first flexible bag having first walls of substantially fluid impervious material defining a first cavity;

a second flexible bag disposed within the first cavity and having second walls of substantially fluid impervious material different from the first walls and defining a second cavity interiorly of the first bag;

a third flexible bag disposed within the first cavity and having third walls different from the first walls and the second walls and defining a third cavity interiorly of the first bag and exteriorly of the second bag;

means extending through the first walls and the second walls for providing access to the second cavity for filling the second cavity with a first fluid;

means extending through the first walls and the third walls for providing access to the third cavity for filling the third cavity with a second fluid; and

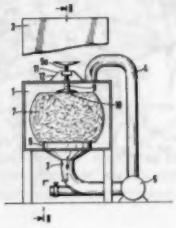
the first fluid being isolated from regions exterior of the mattress by at least two of the first walls, second walls, and third walls.

4,150,448

PROCESS OF DYEING FLOCKED TEXTILE FIBERS

Ludwig Plack, Biedenkopf, Fed. Rep. of Germany, assignor to Obermaier & Cie., Neustadt an der Weinstrasse, Fed. Rep. of Germany

Division of Ser. No. 731,784, Oct. 12, 1976, Pat. No. 4,103,523.
This application May 8, 1978, Ser. No. 903,882
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546878
Int. Cl.[2] D06B 5/14
U.S. Cl. 8—150 5 Claims



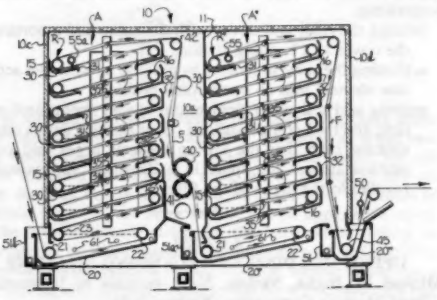
1. Process of dyeing flocked textile fibers wherein said fibers have been washed and dried and are provided in the form of a pressed ball, comprising providing a closable vessel with an outlet opening for dye liquors and of greater cross-sectional size than that of the pressed ball, introducing the pressed ball into said vessel and biassing the pressed ball against the dye liquor outlet opening, circulating dye liquor through said vessel until the desired dyeing is effected, thereafter drying and loosening the dyed fibers of the pressed ball.

4,150,449

METHOD AND APPARATUS FOR WASHING TEXTILE FABRIC

James E. Talbert, Lancaster, S.C., assignor to Morrison Textile Machinery Co., Fort Lawn, S.C.

Filed Apr. 26, 1978, Ser. No. 900,249
Int. Cl.[2] D06B 3/12
U.S. Cl. 8—151 16 Claims



1. A method for washing textile fabric in open width comprising:

advancing fabric generally upwardly through a washing zone, while

cascading wash water downwardly within the zone from one to another of a plurality of vertically stacked cascade trays having respective spill lip portions, while

catching and maintaining in progressively lower trays increasingly larger quantities of wash water, and while

guiding the upwardly advancing fabric through the wash water and along a sinuous path having a plurality of substantially planar runs inclined to the horizontal,

whereby the greater the need for washing of an incremental length of fabric, the greater is the volume of water in which said incremental length is immersed as the fabric is being progressively cleaned during its upward travel through the zone.

9. Apparatus for washing textile fabric in open width comprising:

housing means for defining a washing zone,

cascade tray means mounted in said housing means and including a vertically stacked array of a plurality of cascade trays each for catching wash water spilled from any next adjacent higher tray and having progressively greater capacities for maintaining in progressively lower trays increasingly larger quantities of wash water,

means mounted in said housing means for advancing fabric generally upwardly through said zone and for guiding advancing fabric to be immersed in wash water in said trays and pass along a sinuous path having a plurality of substantially planar runs inclined at an angle to the horizontal, and

means for delivering wash water into an upper tray in said array of trays to cascade downwardly from tray to tray and upon fabric in said runs within said zone,

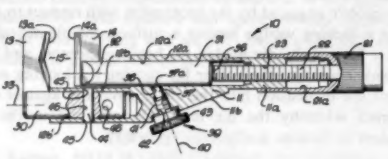
whereby the greater the need for washing of an incremental length of fabric, the greater is the volume of water in which said incremental length is immersed as the fabric is progressively cleaned during upward travel through said zone.

4,150,450

THREAD REFORMING TOOL WITH LOCKABLE ROTARY JAW STRUCTURE

Henry A. Laub, Jr., 1736 N. Allen, Pasadena, Calif. 91104, and Steven D. Laub, 9340 E. Olive St., Temple City, Calif. 91780

Filed Jan. 23, 1978, Ser. No. 871,631
Int. Cl.[2] B23G 5/00
U.S. Cl. 10—1 B 3 Claims



1. In apparatus for re-forming a helical screw thread on a body, said apparatus including

(a) carrier means,

(b) opposed jaws shaped for reception in the thread defined groove at opposite sides of the body, one of the jaws carried by the carrier means,

(c) a shaft carrying the other jaw and defining an axis about which said other jaw and shaft are rotatable, the improvement comprising:

(d) brake means on the carrier means and adjustable to selectively prevent rotation of said shaft and other jaw about said axis after said other jaw has been received in the thread defined groove, whereby the rotary position of said other jaw relative to the one jaw may be positively fixed during re-forming of the thread as the jaws are rotated relatively about said body,

(e) said brake means including a braking element in a bore formed in the carrier means, and a manually adjustable member located to exert force acting to push said element against said shaft, said element being cylindrical and having a conically tapered tip with a slant height surface portion engageable with said shaft, and said member having threaded interfit with the carrier means, said conically tapered tip having an axis extending acutely relative to the axis of the shaft so that said slant height surface portion has substantial surface engagement with the shaft,

(f) there being a second shaft carrying the one jaw, both of

said shafts extending in parallel relation and carried by the carrier means, said member being in the path of an endwise extension of said second shaft,

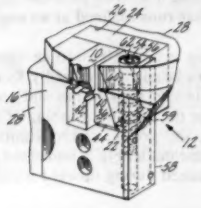
(g) the member including a manually rotatable knob protectively located closely adjacent a relieved wall defined by the carrier.

4,150,451

DIE HOLDER ASSEMBLY

Edwin J. Skierski, Campbellsville, Ky., assignor to USM Corporation, Farmington, Conn.

Filed Mar. 1, 1978, Ser. No. 882,880
Int. Cl.[2] B21K 1/44; B23G 9/00
U.S. Cl. 10—9 **12 Claims**



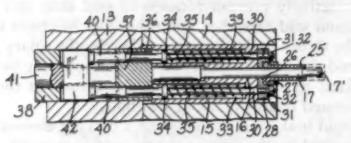
1. A die holder assembly comprising a die holder formed with a die-receiving pocket having a bottom and a side wall, a die wedge formed with an angular protrusion on a first face thereof and adapted to mate with at least a portion of a wall of a substantially correspondingly shaped groove in the die which is to be rigidly locked in the pocket, the groove being larger in transverse section than the protrusion, the die wedge having another face extending at an acute angle to the first face which angle is less in inclination than the inclination of said wall of the groove engaged by the protrusion with respect to said first face a locking wedge having a surface complemental to said other face of the die wedge for bearing thereon, and fastener means secured to the holder for causing the locking wedge to force the protrusion into the die groove and against the wall thereof whereby the die is rigidly clamped in the pocket against its bottom wall.

4,150,452

PUNCH STRIPPER

Jiri V. Pazdirek, Southington, Conn., assignor to Textron Inc., Providence, R.I.

Filed Oct. 25, 1977, Ser. No. 845,125
Int. Cl.[2] B21K 1/46; B21K 1/64; B21D 53/24, 45/00
U.S. Cl. 10—11 E **9 Claims**



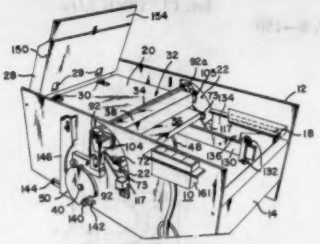
1. In a heading machine having a main frame, a gate and a gate drive, the combination of a punch having a working tip, means mounting the punch removably on the gate, a stripper associated with the punch, means continuously biasing the stripper toward its retracted position, and stripper actuating means, said last named means being synchronized with the gate drive to permit retention of the stripper in retracted relation to the punch tip throughout at least half of the gate drive cycle.

4,150,453

METHOD AND APPARATUS FOR APPLYING A BOOK COVER

Wade Vaughn, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed May 25, 1977, Ser. No. 800,287
Int. Cl.[2] B42C 11/02, 11/04
U.S. Cl. 11—3 **15 Claims**



1. A book cover applicator for applying a cover to a filler having a spine coated with a heat activatable adhesive which sets upon cooling, said applicator comprising:

means for holding the filler and cover with the spine and a portion of the cover at a bonding station; and

bonding means mounted adjacent said bonding station for effecting an adhesive bond formed by the spine adhesive between the spine and said cover portion, said bonding means including means for selectively applying heat to the spine adhesive, a setting member moveable to and from an operational position in which it contacts said cover portion and urges said cover portion against the spine in a direction approximately parallel to the plane of the filler, said setting member being constructed of thermally conductive material so that when it is in its operational position it conducts heat from the adhesive, and actuation means for moving the setting element into and out of its operational position, the actuation means including means for moving the setting element into its operational position after application of heat to the spine adhesive.

14. A method for applying a cover to a filler having a spine covered with a selectively activatable adhesive, said method comprising:

holding the filler and cover with the spine and a portion of the cover at a bonding station;

activating the spine adhesive; by moving an adhesive activation element into an operational position;

moving said activation element out of said operational position; and then contacting said cover portion with a setting element such that the setting element urges said cover portion against the spine in a direction approximately parallel to the plane of the filler.

4,150,454

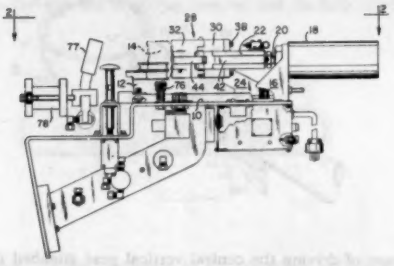
UPPER MOLDING AND FLANGING MACHINE

Michael M. Becka, Nashau, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Mar. 27, 1978, Ser. No. 890,747
Int. Cl.[2] A43D 11/00, 21/00
U.S. Cl. 12—53.5 **5 Claims**

1. An upper molding and flanging machine comprising: a male mold; a female mold having a back part and side parts, said side parts being mounted for inward-outward movement with respect to the back part; means for imparting such relative forward movement of the female mold with respect to the male mold as to cause the back part to press an end of an upper mounted on the male mold against the corresponding end of the male mold and to cause the side parts to move inwardly and press side portions of the upper against the sides of the male mold; a wiper associated with each side part; and wiper

operating means effective to impart inward movement of the wipers with respect to their associated side parts to thereby enable the wipers to form a flange on the margin of the upper; characterized in that the wiper operating means comprises:



mounting means so mounting the wipers to the female mold as to impart inward movement of the wipers with respect to their associated side parts pursuant to said inward movement of the side parts.

4,150,455

METHOD FOR MANUFACTURING A FOOTWEAR AND FOOTWEAR

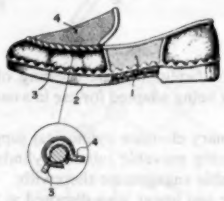
Tatsuo Fukuoka, 3,3 Ban, 2-chome, Shin-Minami-Fukushima Tokushima City, Japan

Continuation-in-part of Ser. No. 629,116, Nov. 5, 1975, and a continuation-in-part of Ser. No. 511,243, Oct. 2, 1974, Pat. No. 3,952,358, and a continuation-in-part of Ser. No. 402,967, Oct. 3, 1973, abandoned. This application May 26, 1977, Ser. No. 800,733

Claims priority, application Japan, Sep. 24, 1976, 51/115169; Dec. 16, 1976, 51/151613

Int. Cl.[2] A43D *9/00;* **A43B** *3/13, 1/02*

U.S. Cl. 12—142 RS **3 Claims**



1. A method for manufacturing footwear comprising opening divided female molds for an upper, mounting an upper base on a male mold, closing the divided female molds for the upper, injecting molten resin material for the upper into an upper molding cavity so as to mold outer layer members of synthetic resin onto an outer surface of said upper base, opening the divided female molds for the upper after cooling or hardening of the resin material, transferring said male mold to a predetermined position within divided female molds for a sole, closing said divided female molds for a sole, and injecting molten synthetic resin material for the sole into a sole molding cavity so as to mold a sole integrally with the upper.

4,150,456

FLOOR SCRUBBER AND BUFFER

David M. Alvarez, 3222 Street Rd., Cornwell Heights, Pa. 19020, and John M. Alvarez, P.O. Box 117, Wycombe, Pa. 18980

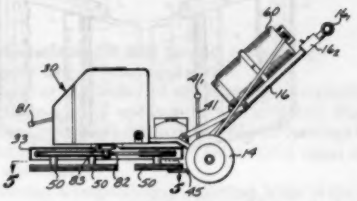
Filed Jul. 7, 1978, Ser. No. 922,767

Int. Cl.[2] A47L *11/283*

U.S. Cl. 15—49 R **4 Claims**

1. In a floor scrubber and buffer assembly including a plurality of brushes adapted for contact with a floor, power means for articulating said brushes and transporting means for translating said assembly along said floor, the improvement comprising:

a circular cage suspended for rotation from said transporting means said cage including a plurality of brush pulleys deployed at substantially equal radial positions in said cage each said brush pulley being connected to one of said brushes and aligned for rotation along axes parallel to the central axis of said cage, a counter pulley disposed proximate the center of said cage and secured to said transporting means and a pulley belt surrounding said brush pulleys and engaging by the exterior periphery thereof said counter pulley;



transmitting means connected between said cage and said power means for transmitting rotary power to said cage; and

a cleaning device mounted for pivotal articulation on said transporting means and including a cleaning bar deployed for translation into or out of the path of said brushes, a support bar connected to vertically extend from said cleaning bar, a tubular housing connected to said transporting means and adapted to receive said support bar in telescopic translation, detent means formed on said housing and support bar for latching said cleaning bar in a first or second position respectively in and out of the path of translation of said brushes and spring means disposed between said housing and support bar for latching said cleaning bar in said first or second position.

4,150,457

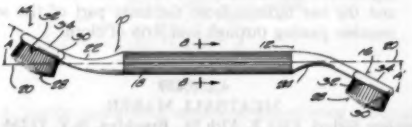
TOOTHBRUSH

David F. Larson, N113 W13341 Crestview Dr., Germantown, Wis. 53022

Filed Sep. 26, 1977, Ser. No. 836,365

Int. Cl.[2] A46B *9/04*

U.S. Cl. 15—106 **10 Claims**



1. A toothbrush comprising;

an elongated handle including an intermediate portion having a longitudinal axis, and

a pair of brush heads respectively secured to opposite ends of said handle, said brush heads extending in substantially parallel planes and including bristle tufts respectively secured thereto for forming a pair of substantially identical bristle surfaces,

each of said brush heads extending at an angle with respect to said longitudinal axis so that one of said bristle surfaces generally extends inwardly towards said intermediate portion of said handle and the other one of said bristles surfaces generally extends outwardly away from said intermediate portion of said handle, whereby said brush

heads can be effectively utilized to remove plaque from all the surfaces of all the user's teeth and gums.

4,150,458

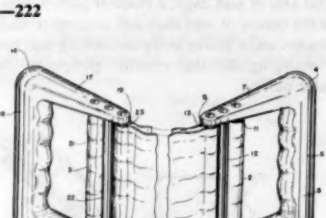
BODY SCRUBBER

Louis Compere, R.F.D. #1, Box 731, Florence, Miss. 39073

Filed May 12, 1978, Ser. No. 905,140

Int. Cl.[2] A47K *7/02*

U.S. Cl. 15—222 **1 Claim**



1. A body scrubber, comprising

an endless closed loop strip of body scrubbing cloth having spaced opposite first and second looped ends with stretched substantially flat;

a first hand grip comprising a first substantially square U-shaped member having a hand-gripped head part and a pair of spaced parallel arms extending substantially perpendicularly from the ends of the head part and having free ends spaced from said head part, and a plurality of bars affixed to and extending substantially perpendicularly between the arms in the area of the free ends thereof parallel to said head part; and

a second hand grip comprising a second substantially square U-shaped member having a hand-gripped head part and a pair of spaced parallel arms extending substantially perpendicularly from the ends of the head part and having free ends spaced from said head part, and a plurality of bars affixed to and extending substantially perpendicularly between the arms in the area of the free ends thereof parallel to said head part, the bar closest to the head part of the first member passing through the strip of cloth at the first looped end thereof, said strip of cloth passing around the next-adjacent bar of said first member and the bar farthest from the head part of the first member passing through said strip of cloth, the bar closest to the head part of the second member passing through said strip of cloth at the second looped end thereof, said strip of cloth passing around the next-adjacent bar of said second member and the bar farthest from the head part of the second member passing through said strip of cloth.

4,150,459

MEATBALL MAKER

Anthony Siclari, 1261 E. 57th St., Brooklyn, N.Y. 11234

Filed May 19, 1977, Ser. No. 798,631

Int. Cl.[2] A22C *7/00*

U.S. Cl. 17—32 **5 Claims**

1. A meat ball making device, comprising:

a base,

a handle portion attached to a proximal end of the base,

an outer scoop attached to a distal end of the base,

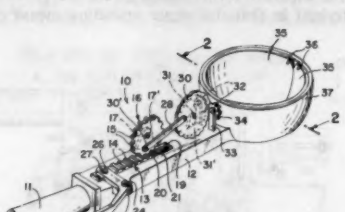
a pair of inner scoop members pivotally attached to the outer scoop,

means of pivoting the inner scoop members attached to the inner scoop members and attached to the base,

a pin attached to a proximal portion of each of the inner scoop members and passing through the outer scoop,

a gear attached to a proximal end of each of the pins passing through the outer scoop,

a central vertical circular gear engageable with each of the gears attached to each of the inner scoop members, and



means of driving the central vertical gear attached to the base.

4,150,460

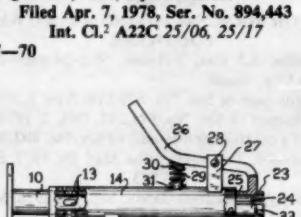
FISH HOLDER WITH ROTATABLE CLAMPING JAWS

V. Doyne Clark, Faulkner County, Ark., assignor to Carrol Herring, Quitman, Ark., a part interest

Filed Apr. 7, 1978, Ser. No. 894,443

Int. Cl.[2] A22C *25/06, 25/17*

U.S. Cl. 17—70 **12 Claims**



1. A holder for facilitating the dressing of fish and small game, said holder being adapted for use in a cantilever position and comprising:

an inner stationary elongate cylindrical support shaft;

an outer rotatably movable tubular cylinder fitted on said shaft in slidable engagement therewith;

coacting upper and lower jaws disposed at the outer end of said rotatably movable cylinder, the upper jaw being reciprocably movable between closed and open positions with respect to said lower jaw;

spaced first and second manually operable means secured exteriorly on said outer cylinder;

said first manually operable means being operable to effect reciprocable movement of said upper jaw; and

said second manually operable means being operable to effect a predetermined rotary movement of said outer cylinder about said inner support shaft.

4,150,461

CLEANING OF TEXTILE FIBER TUFTS

Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,602

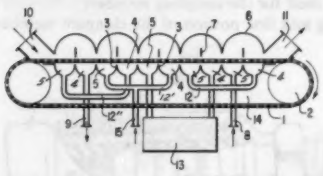
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658072

Int. Cl.[2] D01J *7/00*

U.S. Cl. 19—200 **6 Claims**

1. In a method for removing dust from textile fiber tufts while the tufts rest on, and are conveyed in a conveying direc-

tion by, an air-penetrable, continuously advancing screening element, by alternately and repeatedly mixing the tufts with, and separating the tufts from, cleaning air, the improvement wherein said steps of mixing and separating are carried out by providing the cleaning air in the form of a single stream which passes through the screening element and the tufts thereon a



plurality of times transverse to the conveying direction with each passage being opposite in direction to the preceding passage, so as to cross the conveying path several times in succession and remove dust from the tufts, and by causing the stream of air to have a net flow opposite to the conveying direction.

4,150,462

DRAW FRAME DEVICE FOR SPINNING MACHINES

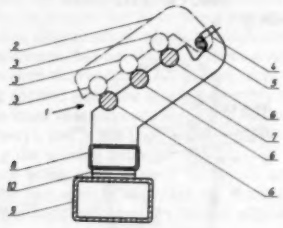
Rolf Griesinger, Goppingen-Faurndau, and Manfred Rienhardt, Donzdorf, both of Fed. Rep. of Germany, assignors to Spindelfabrik Süssen Schurr, Stahlecker & Grill GmbH, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,282

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2616957

Int. Cl.² D01H 5/56

U.S. Cl. 19—294 **17 Claims**



14. Draw frame device for spinning machines comprising:

(i) a preassembled auxiliary draw frame stand including:

a plurality of upper draw frame rolls,

a plurality of lower draw frame rolls,

a longitudinal member,

a plurality of supports spaced from one another and connected to said longitudinal member, said supports including means for bearingly directly supporting said lower rolls,

loading arm means supportingly engaging said upper rolls,

and supporting means carried by said supports and interconnecting said loading arm means to said supports,

(ii) and fastening means for fastening said preassembled auxiliary draw frame stand to a draw frame stand of a spinning machine,

wherein said supporting means includes supporting rod means interconnecting said supports with said loading arm means.

4,150,463

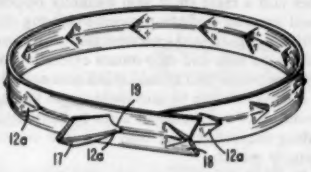
ADJUSTABLE LENGTH STRIP FASTENER

Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205

Filed Sep. 3, 1976, Ser. No. 720,248

Int. Cl.² B65D 63/00

U.S. Cl. 24—16 PB **10 Claims**



1. An adjustable length strip fastener comprising:

an elongated strip of semi-rigid plastic,

means defining a plurality of uniformly and longitudinally spaced and aligned openings in said strip and disposed over the entire length thereof, each of said openings being centrally disposed between the longitudinal edges of the strip, and

means defining a longitudinally extending hinge in the strip, said hinge being substantially centrally disposed between the longitudinal edges of the strip whereby said strip may be folded along said hinge and one end of said strip can be passed through one of said openings adjacent the other end thereof to form a loop which can be locked, said hinge defining means comprising a group of apertures between each next adjacent pair of said openings and cut through the strip substantially along the central longitudinal axis thereof, said apertures being of substantially smaller cross-sectional area than said openings and being substantially more closely spaced than said openings.

4,150,464

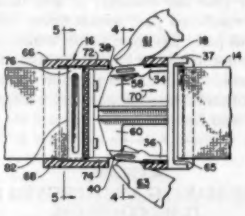
BUCKLE

Richard J. Tracy, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 10, 1977, Ser. No. 823,227

Int. Cl.² A44B 11/25

U.S. Cl. 24—77 R **8 Claims**



1. A buckle comprising separable cooperating receptacle and clasp members, said receptacle member including a generally flat tubular body having relatively wider side walls and relatively narrower top and bottom walls, an opening at one end of said body for receiving said clasp member, and locking slot means including a pair of through slots formed in opposed facing relation in said top and bottom walls and spaced apart from said opening at said one end a predetermined distance, said clasp member including a base member and a pair of resilient arms extending outwardly from opposite ends of said base member, each of said resilient arms including locking tab means for releasably engaging said locking slot means of said receptacle means, said locking tab means of said clasp member including raised edge portions at leading ends of said resilient arms adapted to be cooperatively accepted by said through slots and spaced apart in excess of said top and bottom walls of

said receptacle for displacing said arms during insertion in said receptacle member and for snappingly engaging said through slots when passing therethrough, guide means for guiding said clasp member for insertion into and removal from said receptacle member, said guide means including a pair of facing elongated groove means carried by said side walls of said receptacle member and a rigid third arm medially disposed between said resilient arms on said clasp member having means thereon for slideably engaging said grooves, said third arm connected at one end to said base and stop means extending laterally from adjacent the opposite end of said third arm and terminating in normally spaced relation to said locking tab means to define a limit of bending of said resilient arms to substantially prevent over bending thereof during insertion into or removal from said receptacle means.

4,150,465

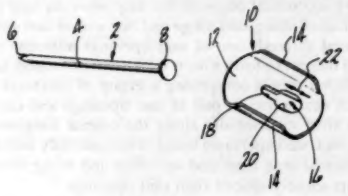
INSULATION FASTENING ASSEMBLY

Edmond P. Gavin, Jr., Madison, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 676,190, Apr. 12, 1976. This application Dec. 22, 1977, Ser. No. 863,184

Int. Cl.[2] A44B 9/00

U.S. Cl. 24—85 B **6 Claims**



1. A fastening assembly for use in blind fastening a resilient and compressible sheet-like layer of material to a supporting surface, said assembly comprising: a nail-like fastener having an elongated shank of substantially constant cross-section, a pointed end, and a radially expanded head end of predetermined diameter; and a planar clip member formed with a slot for receiving the fastener shank, said slot having a length which is greater than the diameter of said fastener head and consisting of a restricted part which opens into an elliptical part, each of said parts having a width which is less than the diameter of said fastener head but greater than the diameter of said fastener shank, said elliptical part having a width greater than the width of said restricted part and a length greater than the diameter of said fastener head.

4,150,466

METHOD OF MAKING AN IMPROVED HOSE AND TUBE COUPLING

Louis T. Horvath, Solon, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Division of Ser. No. 753,897, Dec. 23, 1976, Pat. No. 4,064,614. This application Aug. 30, 1977, Ser. No. 830,492

Int. Cl.[2] B23P 17/00

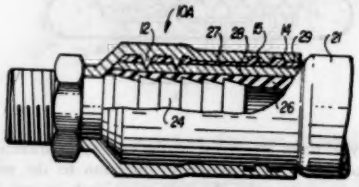
U.S. Cl. 29—417 **14 Claims**

1. In a method of making an improved permanently attachable coupling member for the end of a hose or tube for use in conveyance of fluids under pressure, said coupling member comprising a body member comprised of a coupling attachment means end, a nipple extending from said attachment means end, an external annular protruding member and external recessed securement means disposed intermediate said attachment means end and said nipple, a shell member disposed concentrically about the nipple and secured at one end thereof to the body member, the method including the steps of:

(a) molding or casting a plurality of solid substantially symmetrical, three-dimensionally circumferentially spaced barbs on the inner wall of an elongate member having a central longitudinal axis therethrough, said barbs having a base thereof integral with the inner wall of the elongate member and extending radially inwardly from the base towards the central longitudinal axis of the elongate member and ending in a substantially pointed apex;

(b) providing a length of the elongate member suitable for use as a shell for the coupling member;

(c) forming said first portion of the elongate member into a



substantially frusto-conical shape terminating at the first end of the elongate member;

(d) inserting said coupling member nipple into the elongate member from the first end thereof so that the elongate member is disposed concentrically about the nipple and said first end is axially aligned radially outwardly from the coupling body member securement means; and

(e) compressing said first end into the coupling body member securement means to provide a shell in secured relationship therewith.

4,150,467

METHOD AND MANDREL FOR BLIND RIVETING

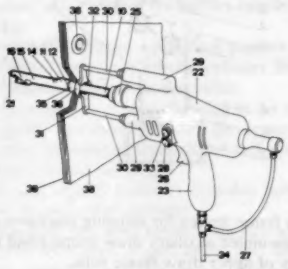
Carl O. Helgesson, Ankdammsgatan 21, Solna, and Jan F. Wallenius, Nälsby Allé 59, Taby, both of Sweden

Filed May 11, 1978, Ser. No. 905,119

Claims priority, application Sweden, Nov. 10, 1976, 7612485

Int. Cl.[2] B21J 15/34

U.S. Cl. 29—26 B **7 Claims**



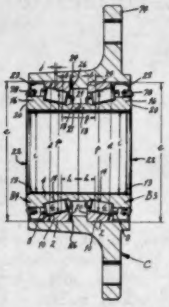
1. In a method for blind riveting wherein a hollow or tubular rivet is slipped onto one end of a mandrel and the shank of the rivet, after having been inserted through a hole together with the mandrel extending through the rivet, is widened by withdrawing the mandrel through the rivet to set the rivet and wherein the hole is cut by using the mandrel as a drill, the improvement comprising cutting the hole by means of a drill bit located on the mandrel at the other end thereof that is eccentric in relation to the axis of the mandrel, widening the rivet by means of a cylindrical portion on the mandrel located between the said one end thereof and said bit to an inside diameter at least as large as the largest cross dimension of the eccentric bit and removing the mandrel from the set rivet by passing the eccentric bit through the rivet.

4,150,468

ADJUSTING PROCESS FOR BEARINGS

William E. Harbottle, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Division of Ser. No. 628,509, Nov. 3, 1975, Pat. No. 4,054,999. This application Aug. 1, 1977, Ser. No. 820,466
Int. Cl.[2] B23P *11/00*; B21K *1/04*
U.S. Cl. 29—148.4 C 23 Claims



1. A process for adjusting a bearing assembly that mounts a shaft within a housing and includes a pair of outer raceways located in the housing and a pair of inner raceways adapted to be fixed in position around the shaft, with each inner raceway being located opposite a different outer raceway, and rolling elements arranged in two rows between opposed inner and outer raceways, the raceways and the rolling elements being configured such that the bearing assembly takes thrust loading in both axial directions as well as radial loading, at least the raceways of one pair being on separate races so that axial positioning of the races relative to each other determines the adjustment of the bearing, said process comprising: placing a deformable spacer between the races on which the raceways of said one pair are located, the spacer being of lesser compressive strength than the races; applying a compressive force to at least one of the races with the force being directed such and being of sufficient magnitude to plastically deform the spacer between the two races, but not the races themselves, whereby the spacing between the racewyas of the two races diminishes, the force being applied while the bearing assembly is disassembled so that the inner raceways are outside of and remote from the outer raceways; and while the force is applied, measuring and monitoring the spacing between the raceways of the two races, the force being applied until the space between the raceways on the two races is such that the bearing assembly, upon being assembled, will have the desired adjustment.

4,150,469

ARROWHEAD EXTRACTOR

Anthony J. Hoggard, Merrill, Mich., assignor to Tomar Corporation, Harbor Springs, Mich.

Continuation of Ser. No. 769,519, Feb. 17, 1977, abandoned, which is a division of Ser. No. 705,764, Jul. 16, 1976, Pat. No. 4,043,020. This application Mar. 13, 1978, Ser. No. 886,050
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—254 10 Claims

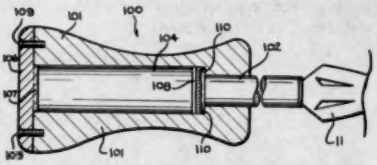
1. The tool adapted for the extraction of arrowheads from stumps, trees and the like which comprises:

(a) a shaft having a longitudinal axis and having one end adapted for attachment with an arrowhead;

(b) a flange provided on said shaft so that there is an elongate portion of the shaft between the end for arrowhead attachment and the flange;

(c) a housing member mounted on the shaft and adapted to be gripped by the hand having a central passage adapted for sliding engagement with the shaft and having an abutment at one end of the passage for hammering engagement with the flange when the shaft is pulled from the housing; and

(d) moveable retaining means provided on the housing for



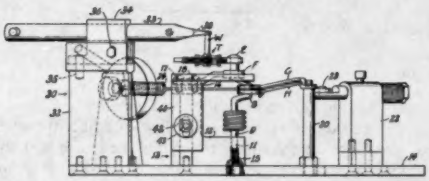
selectively contacting and holding the shaft in a fixed position relative to and within the housing from outside of the housing and by hand when the tool is not in use for pulling.

4,150,470

FIXTURE FOR GAS METER REPAIR

Clyde A. Hansen, 2276 Crescent Sq., Rte. 4, Green Bay, Wis. 54303

Filed Jan. 26, 1976, Ser. No. 652,068
Int. Cl.[2] B23D *19/10*
U.S. Cl. 29—401 R 7 Claims



1. A fixture for mounting a gas meter tangent assembly during repairs, which comprises:

a base;

crank mounting means affixed to said base for rotatably mounting the crank end of the assembly so that the tangent wrist of the assembly is in a vertical position and the assembly is mounted above said crank mounting means;

frame arm mount affixed to said base for fixedly mounting the crank frame arm to the assembly so that the assembly rotates freely in said crank mounting means while it is fixedly mounted on said frame arm mount;

locator means affixed to said base for adjustably locating and maintaining the position of the tangent wrist of the assembly and having a portion thereof adjustable normally to the tangent wrist of the assembly above the crank mount for indexing with the tangent wrist;

locking means affixed to said base for locking the crank of the assembly said locking means having portions thereof for engagement with the assembly for locking the crank of the assembly and the taking up slack in it so that said locator means indexes on a rigid, unslacked assembly.

4,150,471

METHOD OF MAKING ARTIFICIAL INTRAOCULAR LENS

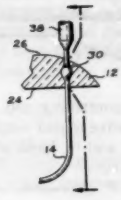
William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

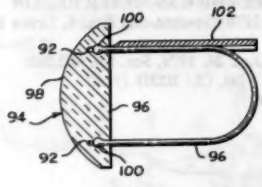
Division of Ser. No. 615,275, Sep. 22, 1975, Pat. No. 3,996,626. This application Sep. 13, 1976, Ser. No. 722,909
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—450 8 Claims

1. The method of locking an iris clip of wire in a lens of material suitable for implantation in the eye comprising the steps of:

forming in said lens an opening of a predetermined diametral size;

producing a rounded bead-like terminal enlargement upon one end of said iris clip, said enlargement being of substantially greater cross-sectional size greater than the diametral size of said opening; and





forcing said enlargement into said opening in a manner and to an extent causing a cold flow of adjacent material of said lens laterally over the major portion of said enlargement, said flow at least partially closing said opening immediately over said enlargement thereby locking said clip against longitudinal displacement in said lens.

4,150,472

PROCESS FOR MANUFACTURING STAINLESS STEEL SINKS WHOSE TUBS OR DRAIN BOARDS ARE COLORED

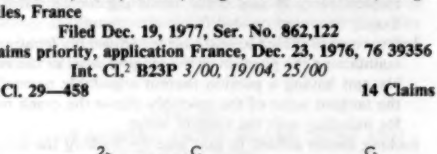
Claude Derain, Paris, France, assignor to Eviers Denis, Feugerolles, France

Filed Dec. 19, 1977, Ser. No. 862,122

Claims priority, application France, Dec. 23, 1976, 76 39356

Int. Cl.[2] B23P *3/00, 19/04, 25/00*

U.S. Cl. 29—458 **14 Claims**



1. A process for manufacturing a sink of stainless steel having a tub member connected to a plate member forming a drain board, said process comprising forming said members of stainless steel, coating one of said members with an adherent color layer of abrasion resistant material, the tub member being joined to the plate member along a rounded annular connection region, to which said color layer extends, and tangentially grinding said annular connection region to form a chamfer providing a precise connection between the color layer of said one member and the surface of the other member.

4,150,473

METHOD TO PRODUCE AN ANCHOR ON A TENDON TWISTED OF SEVERAL STEEL WIRES

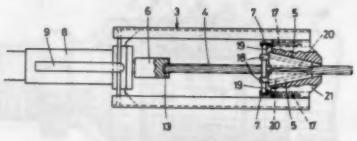
Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG, Bern, Switzerland

Division of Ser. No. 645,993, Jan. 2, 1976. This application May 31, 1977, Ser. No. 801,732

Claims priority, application Switzerland, Nov. 21, 1975, 15141/75

Int. Cl.[2] B23P *25/00*

U.S. Cl. 29—461 **2 Claims**



1. Method of producing an anchor on a tendon formed of a number of twisted steel wires intended to be anchored in a hardening agent capable of being poured, including the steps of seizing the tendon by seizing means at two places axially spaced from each other and from the ends of said tendon, providing guide means for the tendon between the seized means and immediately adjacent the seized places thereof, and exerting axially compressive forces on the tendon to bulge the same by moving said two places toward each other to stress the steel wires beyond their yield point at spaced portions thereof, whereby a widening is formed wherein the guide means control the shape of the wires as they are bulged and wherein said axially compressive forces can be exerted over any portion of the tendon to form an anchor of permanently buckled wires having straight sections in the shape of a double-cone.

4,150,474

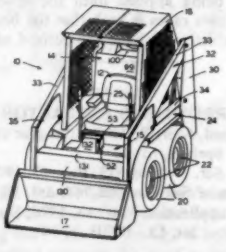
METHOD OF MANUFACTURING AN OVERHEAD GUARD FOR A SKID STEER LOADER

James J. Bauer, Lisbon, and Thomas M. Sagaser, Gwinner, both of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 654,262, Feb. 2, 1976, Pat. No. 4,060,261. This application Jun. 22, 1977, Ser. No. 808,926

Int. Cl.[2] B21D *39/02*

U.S. Cl. 29—463 **3 Claims**



1. In a skid steer vehicle, a method of manufacture for the overhead guard of such vehicle, comprising the preparation of two sheets of metal, cutting a first sheet of metal to define a right side wall, a right half of the top wall and a right half of the rear wall of the overhead guard and cutting a second sheet to define a left side wall, a left half of the top wall and a left half of the rear wall of the overhead guard, providing respective folding lines between each side wall and respective halves of top and rear walls, folding each sheet to direct said top and rear wall portions inwardly, to thus form respective right and

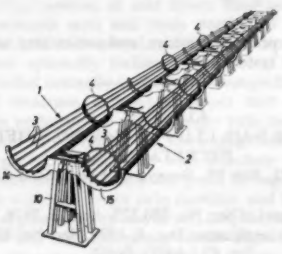
left half sections of the overhead guard, and joining said half sections together along a center seam extending along the midline of the top and rear walls of the overhead guard.

4,150,475

METHOD OF MANUFACTURING A REINFORCING CAGE FOR A CONCRETE POST, AND A FIXTURE FOR CARRYING OUT THE METHOD

Per-Erik Bondpers, Växjö, and Kjell-Åke Wickström, Strängnäs, both of Sweden, assignors to A-Betong AB, Växjö, Sweden

Filed Feb. 7, 1978, Ser. No. 875,725
Claims priority, application Sweden, Feb. 7, 1977, 7701334
Int. Cl.[2] B23P *21/00*; E04B *1/30*
U.S. Cl. 29—469 12 Claims



1. A method of manufacturing a reinforcing unit in the form of a cage or basket for a concrete post, comprising the steps of placing reinforcing rods on pivotable, concave support arms in a fixture so as to form two separate, concave parts of the finished unit;

securing support rings along said parts perpendicularly to the axis of the finished unit;

bringing together the parts; and

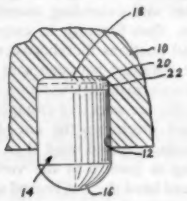
joining the support rings of one part to the reinforcing rods of the opposite part.

4,150,476

METHOD OF MOUNTING INSERT FOR MINING TOOLS AND THE LIKE

John F. Kita, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 700,876, Jun. 29, 1976, Pat. No. 4,077,734.
This application Oct. 19, 1977, Ser. No. 843,426
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—525 1 Claim



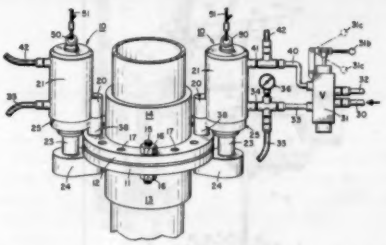
1. The method of mounting a hard wear resistant rod-like insert in the body of a mining bit which comprises: drilling a hole in the body to a depth equal to a substantial portion of the length of the insert, forming on the inner end of the insert a flat central area normal to the longitudinal axis of the insert, rounding when viewed in side the peripheral surface of the flat central region and tapering a surface leading from the rounded area to the envelope of the insert, reaming the bottom of the hole to a configuration substantially the same as the inner end of the insert, densifying the surface of the hole, and press-fitting the insert in the hole with the inner end of the insert engaging the bottom of the hole.

4,150,477

PRE-LOADING JOINT FLANGES

Willis P. Orr, Lafayette, La., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 21, 1977, Ser. No. 835,111
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—526 R 10 Claims



1. A method for use in connecting or disconnectng two ring joint flanges of a tubular joint, said flanges having aligned bolt holes comprising the steps of:

attaching clamp means to said flanges capable of applying substantially uniform pressure to said flanges up to a preselected, measured compression;

applying said pressure to said flanges through said clamp means;

making up nuts hand-tight on bolts inserted through said bolt holes; and

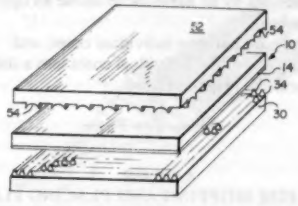
thereafter removing said clamp means from said flanges.

4,150,478

PUNCH DUPLICATING PROCESS

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed Jun. 3, 1975, Ser. No. 583,210
Int. Cl.[2] B22D *11/126*
U.S. Cl. 29—527.2 5 Claims



1. A method of making optical elements including the steps of,

(a) forming a blank of a generally transparent sheet carrying on one side thereof a thin, opaque coating,

(b) forming a photoresist block having a relief surface, said relief surface corresponding to a plurality of microimages of a plurality of macro scenes,

(c) pressing said relief surface onto said thin, opaque coating of said sheet to selectively rupture portions of the coating and form apertures corresponding to the raised portions of said relief surface,

(d) whereby the ruptured portions of the thin, opaque surface correspond to the plurality microimages of the plurality of macro scenes.

4,150,479

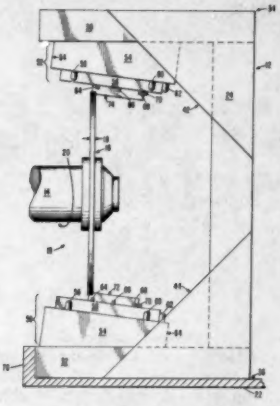
METHOD OF MAKING MAGNETIC HEAD CORES WITH CANT ANGLES

Paul D. Losee, Longmont, and Neil L. Robinson, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 799,637, May 23, 1977, abandoned. This application Apr. 19, 1978, Ser. No. 897,887

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **13 Claims**



1. A method for batch making magnetic heads for reading and writing of digital signals stored on a magnetic surface, said magnetic heads having core pieces with cant angle interfacing the magnetic media, comprising the steps of forming the cant angle between the core pieces by:

1. subjecting the core pieces to a process to generate mating surfaces having a stepped surface profile on each core piece; each of said stepped surface profiles being characteristic of the cant angle and an exact replica of each other;
2. generating a coil window in at least one of the core pieces;
3. aligning the mating surfaces and joining the same with an adhesive to form a first composite structure;
4. generating a core bar by aligning the first composite structure with a second composite structure and joining both structures by an adhesive to define an operation gap therebetween;
5. dicing the core bar into individual cores; and
6. positioning one of the individual cores into a slider assembly to form the magnetic head.

4,150,480

PROCESS FOR SHIPPING AND PLACING FLEXIBLE TRANSMISSION LINE INTO SERVICE

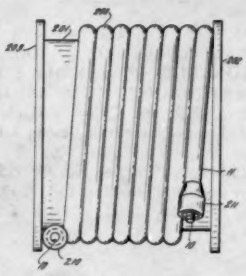
Thomas F. Brandt, Swarthmore, and Philip C. Netzel, Milmont Park, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 21, 1977, Ser. No. 808,708

Int. Cl.[2] H02G *1/00*

U.S. Cl. 29—628 **7 Claims**

1. A process for shipping and placing a flexible transmission line cable into service comprising the steps of fabricating a continuous length of high voltage flexible transmission line cable, electrically testing said cable to determine its suitability for operating in service, filling said cable with a dry high dielectric inert gas under a relatively low positive pressure and sealing the ends of said cable, winding said cable on a shipping reel and shipping said cable to an installation site, unreeling said cable at said installation site, purging said inert gas from said cable and loading an electronegative gas into said cable at



a relatively high positive pressure, and connecting said cable into an electrical system.

4,150,481

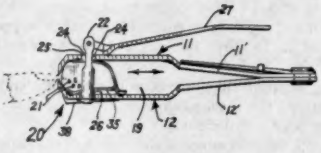
FINGER-TOE NAIL CLIPPER HAVING SHIFTING RECEPTACLE

Manki Min, 45-22, 39th Pl., Sunnyside, Long Island City, N.Y. 11104

Continuation-in-part of Ser. No. 680,377, Apr. 26, 1976, Pat. No. 4,062,109. This application Dec. 6, 1977, Ser. No. 858,022

Int. Cl.[2] A45D *29/02*

U.S. Cl. 30—28 **10 Claims**



1. A finger-toe nail clipper having shifting receptacle, comprising a pair of substantially horizontally disposed upper and lower elongated spring material strip members including forward and rearward end portions, which are respectively connected with each other by remarkably inclined opposing portions of said strip members, and opposite longitudinal sides in each forward end portion thereof, said rearward end portions being rigidly joined together by suitable means and said forward end portions being slightly divergent and spaced apart for movement toward and away from each other, the forward terminal ends of said upper and lower strip members including downturned and upturned mating cutting edges, respectively, opposing each other and extending transversely of said forward end portions, thus forming in curved edges for neat trimming cut of nail portions therebetween, whereby a desirably defined space obtained between said divergent forward end portions of the strip members to receive a receptacle being shifting longitudinally for selective engagement of said receptacle to receive and discharge the cut-off nail portions, an upstanding post having a round head at its lower end disposed in slip-fit and being in journal in the vertically aligned two bores with said round head thereof beared against the opposing outside surface portion of the lower strip member, said two bores being opened respectively through the forward end portions of said strip members, an operating lever pivotally supported from the upper end of said post and being engageable with said upper strip member and swingable into and out of position operative to force said forward end portions of said strip members toward each other, thus bring said cutting edges into cutting engagement with each other, a longitudinally shifting receptacle for receiving and discharging the cut-off nail portions, said receptacle being comprised of opposite longitudinal side walls of said receptacle, and a rear wall struc-

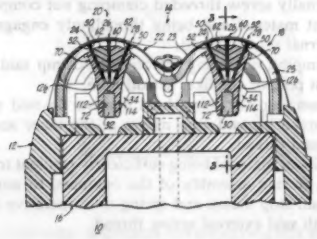
ture upwardly disposed between and being secured relative to the rear marginal edges of said opposite longitudinal side walls, said rear wall structure including an upper abutting member defined with forwardly extended wall portion from the upper marginal portion of said secured rear wall structure, and lower marginal edges of said side walls projecting downwardly, respectively, over said opposite longitudinal sides of said lower strip member, whereby forming a downwardly and forwardly opened body portion of said receptacle received and being shiftingable longitudinally forth and back between forward end portions of said strip members, immediately rearward of said cutting edges with said upper abutting member engaging with the underside of said upper strip member, the forward portion of said upper abutting member including a central forwardly opening recess formed therein in which the opposing portion of said post being received, the lower marginal portion of said rear wall being abutted against the opposing upper surface portion of said lower strip member, a spring means combined with said body portion of said receptacle being associated with one of said strip members except a rearwardly and upwardly inclined resilient leaf spring member being included centrally in the lower marginal portion of said rear wall structure, and whose upper rear end is abutted against the undersurface of said upper strip member centrally intermediate its opposite ends, the engagement of said lower marginal portion of said rear wall structure with the lower strip member defining a fulcrum point of engagement of said receptacle with said lower strip member, and the engagement of said spring means with one of said strip members resulting in serving to bias said receptacle about said fulcrum point to maintain said upper abutting member abutted against the underside of the forward end portion of said upper strip member.

4,150,482

MODULAR CUTTER ASSEMBLY FOR AN ELECTRIC DRY SHAVER

William P. Beck, Westchester, and Francis L. Carr, Downers Grove, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Nov. 14, 1977, Ser. No. 851,152
Int. Cl.² B26B *19/04*
U.S. Cl. 30—43.9 **21 Claims**



1. A modular cutter assembly for insertion as a modular unit into an electric dry shaver having at least one cutter drive shaft rotatably mounted within said electric dry shaver and having a comb assembly disposed in shearing engagement with the inserted cutter assembly, said modular cutter assembly comprising:

at least two cutter blade elements:

means disposed intermediate adjacent cutter blade elements and interfitting with said cutter blade elements for spacing said cutter blade elements in a predetermined manner; and

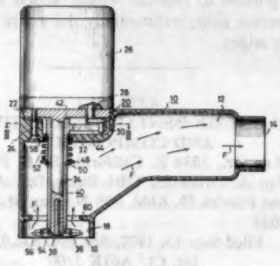
means for retaining said cutter blade elements and said cutter blade element spacing means in a predetermined orientation, said retaining means comprising means interfitting with said cutter drive shaft upon insertion of said modular cutter assembly as a modular unit into said electric dry shaver, thus securing said modular cutter assembly to said cutter drive shaft, and thus enabling said modular cutter assembly to be removed from said cutter drive shaft and replaced as a modular unit while said cutter drive shaft remains rotatably mounted within said electric dry shaver.

4,150,483

HAIR CUTTING DEVICE

Yukio Kanazawa, No. 880, Sekishi-cho, Hamamatsu City, Shizuoka Prefecture, Japan

Filed Jun. 14, 1977, Ser. No. 806,498
Int. Cl.² B26B *19/44, 19/20*
U.S. Cl. 30—133 **6 Claims**



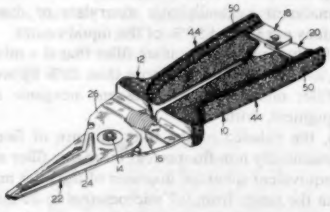
1. A suction type hair cutting device comprising a casing having an air passage therethrough, one end of said air passage forming a suction inlet and the other end of said air passage being adapted for connection to a vacuum source; a fixed circular blade positioned in said suction inlet; an arcuately oscillatory circular blade positioned adjacent to said fixed blade and arcuately oscillatory with respect thereto; and an annular projection formed around the inner surface of said suction inlet, wherein said fixed blade and said arcuately oscillatory blade are positioned with respect to said annular projection to form an air flow passage therebetween.

4,150,484

SHEARS WITH IMPROVED CUTTING ACTION AND METHOD OF MAKING SAME

William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Nov. 2, 1977, Ser. No. 847,697
Int. Cl.² B26B *13/06*; B21K *11/06*
U.S. Cl. 30—254 **9 Claims**



1. A shears comprising

A. a pair of operating members each including sheet metal members having a blade portion at one end, a handle portion at the other end, and an intermediate pivot portion, said blade portions having opposed convexly curvilinear cutting edges extending longitudinally thereof and elongated reinforcing bosses extending along and closely adjacent said cutting edges, said reinforcing bosses projecting oppositely from each other; and

B. pivot means pivotably securing said pivot portions of said operating members together for relative pivotal movement thereof between a closed position wherein the cutting edge of each blade portion overlies the side surface of the blade portion of the other operating member and an

open position wherein said cutting edges are spaced apart, the curves defined by said cutting edges being mirror images and, in said open position of said shears, intersecting at a point spaced from said pivot means towards the outer end of said cutting edges, the cutting angle defined by tangents to said curves of said curvilinear cutting edges at the points of intersection along substantially the entire length thereof during closing movement of said shears being substantially constant and within the range of 12°-30°, said blade portions of said sheet metal members being inclined towards each other and relative to said pivot portion to provide wiping action at the point of intersection along substantially the entire length of said cutting edges.

4,150,485

LIQUID PAINT-ON DENTAL RESTORATIVE PROCESS AND COMPOSITION

Henry L. Lee, Jr., 3534 E. California Blvd., Pasadena, Calif. 91107; Jan A. Orlowski, 1304 Rubio Dr., Altadena, Calif. 91001, and Patrick D. Kidd, 415 N. Lina St., Sierra Madre, Calif. 91024

Filed Sep. 13, 1977, Ser. No. 832,927
Int. Cl.[2] A61K *5/00*
U.S. Cl. 32—15 **12 Claims**

1. A protective and cosmetic dental coating composition for restoring enamel defects and for repairing damaged artificial teeth including chipped acrylic or porcelain veneers, which coating is sufficiently fluid that it can be applied to a tooth surface and will flow to a feather edge, but sufficiently viscous that dripping and running do not occur, and that sets in less than ten minutes to a hard coating that is bonded to the surface to which it is applied, said coating composition consisting essentially of:

A. a liquid acrylate or substituted acrylate resin that is selected from the group consisting of:

(i), a blend comprising:

(a) from 20% to not more than 90% by weight of an aromatic or cycloaliphatic: diacrylate, dimethacrylate, polyacrylate, or polymethacrylate, and

(b) at least 10% by weight of the blend of an aliphatic tri-, di-, or mono-acrylate or methacrylate;

(ii), a homopolymerizable hydrogenated aromatic diacrylate or dimethacrylate; and

(iii), mixtures thereof wherein the total amount of aromatic or cycloaliphatic diacrylate or dimethacrylate does not exceed 90% of the liquid resin;

B. a finely divided particulate filler that is a mixture of:

(i), at least 1% and not more than 20% by weight of the filler mixture of a fluorescent inorganic metal oxide pigment, with

(ii), the balance of the filler mixture of finely divided, essentially non-fluorescent inorganic filler material, the equivalent spherical diameter of the filler mixture being in the range from 0.2 micrometers to 20 micrometers;

C. curing ingredients comprising a peroxide-type initiator and an accelerator; and

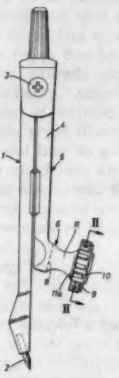
D. a small but effective amount of an ultraviolet absorber; the curing ingredients of the coating being selected and present in amounts to cause curing to occur, upon admixture of the ingredients, in from about ½ minute to about 10 minutes, the filler mixture forming from 30% to 70% by weight of the coating composition and less than 50% of its volume, the density and volume of the filler mixture being selected to maintain the consistency of the uncured coating during placement so that the uncured coating is flowable but does not run or drip, the liquid resin forming essentially the balance of the composition, the cured composition having excellent vitality and cosmetic appearance and appearing natural under ultraviolet light.

4,150,486

DRAWING COMPASS

Raymond A. Payton, Bewdley, England, assignor to Helix International Limited, W. Midlands, England

Filed Jun. 22, 1977, Ser. No. 809,125
Claims priority, application United Kingdom, Jun. 29, 1976, 26952/76; Nov. 19, 1976, 48257/76
Int. Cl.[2] B43L *9/24*
U.S. Cl. 33—27 B **10 Claims**



1. A drawing compass comprising:

(a) a leg having a pointed element at one end thereof and an arm pivotally connected to said leg,

(b) said arm including a stub and a shank having a free end, said stub projecting laterally from said free end of said shank,

(c) said stub having an external screw thread portion and an unthreaded portion thereon and including a socket hole located partially in said thread and unthreaded portions, said hole being suitable for receiving a pencil, ball-point pen, or the like,

(d) inner and outer stop means located at the inner and outer ends, respectively, of said external screw thread, and

(e) an internally screw threaded clamping nut composed of a resilient material and being threadingly engaged with said external screw thread,

(f) said clamping nut being effective to clamp said pencil, ball-point pen, or the like, in said hole,

(g) said clamping nut being held captive on said external screw thread by said stop means at the inner and outer ends of said thread,

(h) said resilient material being sufficiently resilient to permit said nut, during assembly of the compass, to move past one of said stop means and spring into operative engagement with said external screw thread.

4,150,487

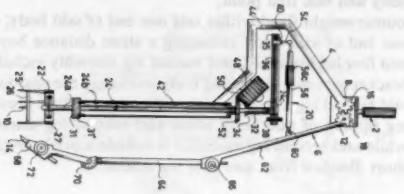
INSTRUMENT FOR TRACING CURVED FIGURES PARTICULARLY ELLIPSES

Aharon P. Grundman, 24 Amsterdam St., Tel Aviv, Israel

Filed May 22, 1978, Ser. No. 908,280
Int. Cl.[2] B43L *11/04*
U.S. Cl. 33—30 R **9 Claims**

1. A compass-type instrument for tracing curved figures, comprising: a manipulatable finger-gripping element; an anchor arm mounted at one end to one end of said finger-gripping element, the opposite end of said anchor arm being adapted to be anchored to the surface on which the curved figure is to be traced; a tracing arm pivotably mounted at one end to said one end of the finger-gripping element, the opposite end of said tracing arm being adapted to trace the curved figure on said surface; and an eccentric linkage, having presettable means for presetting its eccentricity, coupled between said anchor and

tracing arms for constraining the tracing arm to pivot in a presettable eccentric manner with respect to the anchor arm when the finger-gripping element is manipulated to trace the



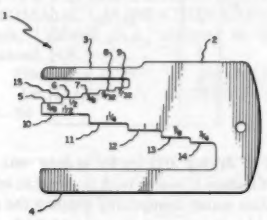
figure, said eccentric linkage comprising a first link coupled at one end of said anchor arm, and a second link having one end presettable along the length of said first link, the opposite end of said second link being coupled to said tracing arm.

4,150,488

CHAIN WEAR INSPECTION GAUGE

Edward R. Behnke, Lockport, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,094
Int. Cl.[2] G01B *3/38, 5/08*
U.S. Cl. 33—168 R **2 Claims**



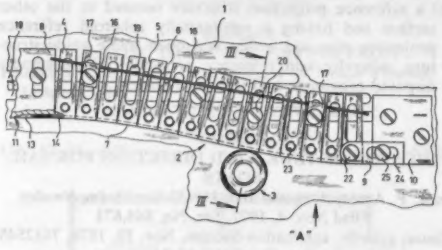
1. A chain wear inspection device having link receiving slots therein for measuring the section thickness of a closed loop link of a standard bent wire link type chain, said inspection device having a flat body formed of sheet material with at least one side forming a straight edge, characterized in that said device includes slot identifying indicia adjacent to each slot for uniquely identifying each slot with the chain size to be measured, each of said slots having an opening smaller than said identified chain size by an amount equal to the limit of permissible wear whereby links fitting into said opening are determined to be worn beyond the acceptable limit, at least one of said slots extending inwardly into said device from the bottom of a larger slot having a larger opening than said one slot, said one slot being delimited by a shoulder intermediate said one slot and said larger slot and each of said slots being formed with one side parallel to said straight edge with a spacing from said straight edge not greater than the inside width of the standard chain link to be measured by said one slot.

4,150,489

ADJUSTABLE TEMPLATE FOR SEWING DEVICE

Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,151
Int. Cl.[2] B43L *13/22*
U.S. Cl. 33—177 **4 Claims**



3. An adjustable template for use in a sewing device for sewing workpieces of different shape, comprising:

a supporting plate having a plurality of slotted holes arranged in longitudinal direction with respect to said supporting plate,

a plurality of segments having

wedge-shaped lateral edges,

a bearing surface for a template follower means,

an oblong hole in longitudinal direction, and

a slot-shaped clearance being formed in said bearing surface in a longitudinal direction,

a flexible connection wire received and slidably fastened in said slot-shaped clearances of said segments,

bolt means in said oblong holes and said slotted holes for fastening several of said segments to said supporting plate after alignment of said bearing surfaces of said segments according to a required course of a seam,

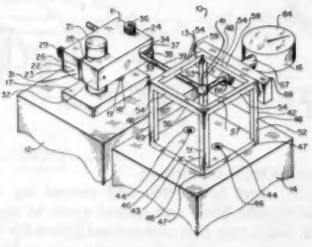
the bearing surfaces of said segments forming a substantially uninterrupted bearing surface for said follower means independent of adjustments for changing the course of a seam; said course of said seam having permissible curves of relatively small and relatively large radii of curvature.

4,150,490

RELATIVE DISPLACEMENT MEASUREMENT APPARATUS

Virgil W. Sluka, Box 24, DTS, Omaha, Nebr. 68101

Filed Jul. 7, 1977, Ser. No. 813,718
Int. Cl.[2] G01B *05/14, 03/22*
U.S. Cl. 33—180 R **8 Claims**



1. A relative displacement measurement apparatus in which a measuring means having means defining a planar surface and a measuring axis substantially perpendicular thereto is utilized for measuring the relative displacement between two surfaces, the apparatus comprising:

(a) an open frame guide structure secured to one of the

surfaces for establishing reference planes with said frame guide structure having sides open so as to permit the positioning of a reference projection structure through said sides and into the interior of the frame guide structure and so as to allow movement of said measuring means parallel to each of said reference planes to permit alignment of the axis of said measurement means with said reference projection structure; and

(b) a reference projection structure secured to the other surface and having a substantially spheroid reference projection disposed within said open frame guide structure, whereby said reference projection is measurably disposed proximate said reference planes.

4,150,491

INDICATOR OF TRUE WIND DIRECTION FOR SAIL BOATS

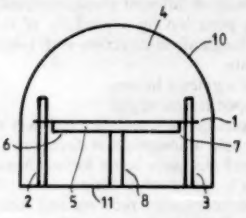
Lars A. P. Ansar, Asogatan 160, 116 32 Stockholm, Sweden

Filed Nov. 4, 1977, Ser. No. 848,673

Claims priority, application Sweden, Nov. 10, 1976, 7612545

Int. Cl.[2] G01C *17/14*

U.S. Cl. 33—349 **7 Claims**



1. An indicator of true wind direction for sail boats, comprising: a compass having a dial, means rotatably supporting the dial, and indicating means stationarily mounted adjacent the periphery of the dial to facilitate the reading of symbols thereon, said compass dial having a plurality of circumferentially arranged consecutive equal parts, each part bearing identical symbols arranged in the same order, and in the same circumferential direction.

4,150,492

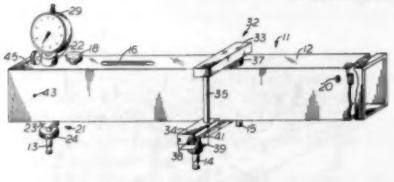
PRECISION LEVEL

Alan C. Tracy, 1335 N. Utah Ave., Davenport, Iowa 52804

Filed Jan. 9, 1978, Ser. No. 867,989

Int. Cl.[2] G01C *9/28*

U.S. Cl. 33—376 **4 Claims**



1. A precision level comprising:

an elongated rigid body, first and second leg assemblies attached to said body and spaced apart to support said body on respective first and second points for which the relative heights are to be determined with respect to horizontal, first level indicating means, a holder, said holder pivotally connected to said body and containing said first level indicating means, said holder being the type that is adjustable for precisely adjusting the tilt of said first level indicating means with respect to the longitudinal direction of said body,

said first leg assembly having a first leg extending downwardly from one end of said body on a longitudinal axis thereof, adjusting means between said first leg and said body for precisely adjusting the distance said body is positioned above said first point,

a differential distance indicator for displaying change of distance between two points, said differential distance indicator being connected between said first leg and said body to indicate precisely change in distance between said body and said first point,

a counterweight fixed within said one end of said body, said one end of said body extending a short distance beyond said first leg assembly, said second leg assembly includes a bracket movable along said body to change the position of said second leg assembly, and said counterweight preventing tipping of said body about said second leg assembly while said second leg assembly is outside a predetermined short distance from said first leg assembly.

4,150,493

DRYING OF ARTICLES

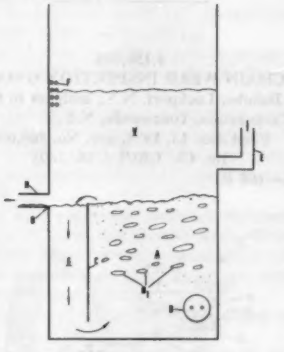
David S. L. Slinn, and Noel Plummer, both of Bristol, England, assignors to I.S.C. Chemicals Limited, London, England

Filed Nov. 4, 1977, Ser. No. 848,727

Claims priority, application United Kingdom, Nov. 4, 1976, 45996/76

Int. Cl.[2] F26B *3/00*

U.S. Cl. 34—9 **14 Claims**



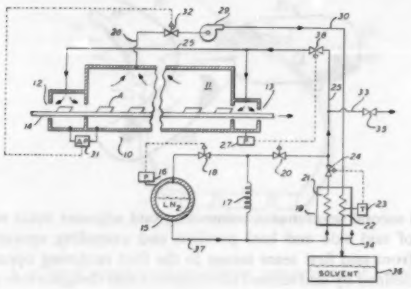
1. A method of drying articles by at least one of displacement and solubilization of water with an organic solvent which is more dense than water, comprising dipping the article into a body of said solvent in a container, said body being made effervescent by rising gaseous bubbles, and said body being separated, except at the top and bottom thereof, from a non-effervescent body of solvent by means of a baffle wall which extends from a level above the bottom of the solvent container to substantially the surface level of solvent in said container, said rising gaseous bubbles causing a circulation of solvent between the effervescent and non-effervescent bodies, and removing water from the upper part of the non-effervescent body of solvent.

8. Apparatus for drying articles by at least one of displacement and solubilization of water with an organic solvent, comprising at least one solvent container compartment, a substantially vertical wall within said container and which extends from a level above the bottom of the container to a desired solvent surface level to divide said compartment into two parts except at the top and bottom thereof, means for generating gaseous bubbles in one part of said solvent container, and an overflow weir between the other part of said solvent container and a solvent/water separator.

4,150,494
METHODS AND APPARATUS FOR RECOVERING SOLVENTS

Ronald D. Rothchild, South Orange, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Aug. 29, 1977, Ser. No. 828,375
Int. Cl.[2] F26B 3/04
U.S. Cl. 34—28 28 Claims

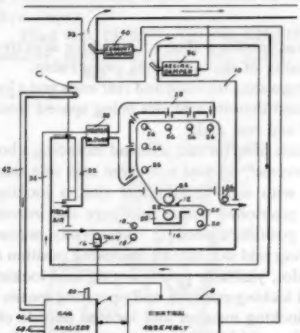


1. A method of recovering solvents evaporated during the curing of solvent borne coatings on material passed through a curing oven having an entrance and exit for passage of said material therethrough, the improvement comprising the steps of: supplying inert gas to said oven to (i) form an inert gas barrier at said entrance and exit and thereby substantially exclude atmospheric oxygen from said oven and (ii) inert said oven to safely maintain a solvent vapor concentration therein of at least 75% of the lower explosive limit of such vapor in air, withdrawing oven atmosphere and condensing at least 85% of the solvent vapors in said withdrawn atmosphere, recovering condensed solvent, and discharging a major portion of the non-condensed withdrawn atmosphere to the ambient.

4,150,495
LEL (LOWER EXPLOSIVE LIMIT) CONTROL WITH AUTOMATIC CALIBRATION CAPABILITY

Nathan Stern, Caldwell, N.J., assignor to Bobst-Champlain, Inc., Roseland, N.J.

Filed May 3, 1978, Ser. No. 902,551
Int. Cl.[2] F26B 21/06; G01N 27/16
U.S. Cl. 34—54 45 Claims

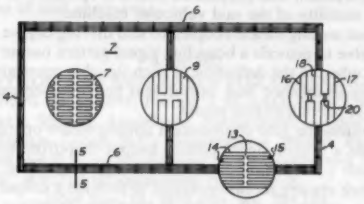


1. An LEL control for regulating the exhaust from an evaporation enclosure through which a solvent laden web passes comprising means operably connected to the enclosure for sensing the solvent concentration therein and for generating a first signal dependent thereupon, means operably associated with the web for sensing the speed thereof and for generating a second signal dependent thereupon, means for combining said first and said second signals to form a control signal, means for regulating said exhaust in accordance with said control signal, and means for calibrating said first signal generating means, said calibrating means comprising means for inhibiting the output of said first signal generating means during calibration.

4,150,496
PLASTIC TRAYS FOR DRYING FRUIT

Harold S. Cloyd, Erie, Pa., assignor to Nosco Plastics, Inc., Jackson, Miss.

Filed Feb. 17, 1977, Ser. No. 769,572
Int. Cl.[2] F26B 25/10
U.S. Cl. 34—238 5 Claims

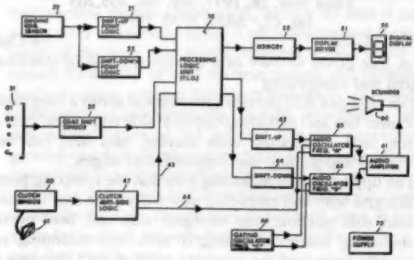


1. A dryer for raisins and the like comprising a drying tunnel with a gas heater for air entering one end of the tunnel and leaving the other end of the tunnel, a plurality of trucks each having a stack of a plurality of fruit holding trays stacked a plurality of trays high, said trucks being butted end to end in said tunnel, each tray having longitudinal end frames at opposite ends of the tray, cross frames of less height than said end frames extending between the ends of said end frames and a fruit holding bed united with said frames, the cross frames of each tray cooperating with the cross frames of the adjoining trays in the stack to provide slots closed at opposite sides by said end frames for the longitudinal flow of air through the stack, said slots between the trays on one truck lining up end to end with the slots between the trays of an adjacent truck, said frames and bed being of thermoplastic having negligible water absorption.

4,150,497
MANUAL GEARSHIFT AND CLUTCH TRAINING APPARATUS INCLUDING SENSORY INDICATION FOR MOST FAVORABLE OPERATOR CONTROL

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Mar. 4, 1977, Ser. No. 774,470
Int. Cl.[2] G09B 9/04
U.S. Cl. 35—11 R 13 Claims



1. A vehicular machine manual gearshift and clutch training apparatus including sensory indicator means providing admonition for the most favorable operator control thereof, comprising in combination:

a. An operator controlled vehicular machine apparatus consisting of at least:

A driving engine means, including an output means therefrom;

A clutch means including an input coupled to said driving means output, wherein said clutch means provides, at an output therefrom, at least a state of engagement and a state of disengagement of said output from said input by means under the control of an operator;

A transmission gearing means including an input coupled to said clutch means output, wherein said transmission means provides, at an output therefrom, at least two combinations of gearing together with a means for operably selecting therebetwixt by means under the control of the operator;

Propulsion means coupled to said transmission means output, wherein said propulsion means is operative to enable the mobility of the said vehicular machine;

b. A speed sensing means coupled to said driving engine means operative to provide a bounding signal pattern output therefrom, wherein the definition of such signal is constrained by the pre-established best operational performance range of the said driving engine means;

c. A transmission gear combination sensing means operative to provide a unique signal pattern output therefrom for each available combination of transmission gearing ratios;

d. A clutch sensing means operative to provide a unique signal pattern output therefrom for at least one condition of engagement, partial engagement, and disengagement of the said clutch means;

e. A processing logic unit means including a plurality of inputs thereto which are operatively connected to the said speed sensing signal output, said transmission gear combination sensing signal output, and said clutch sensing signal output wherein said logic unit is operative to provide at least one derived conditional output signal therefrom the logic combination of which is dependent upon the particular pattern of input signals provided thereto by the said sensing means;

f. A first sensory indicant means operative by at least one signal derived from the said processing logic unit output to provide for the operator an indication of the correct gearing combination which should be engaged;

g. A second sensory indicant means operative by at least one signal derived from the said processing logic unit output to provide for the operator a distinctive indication of the impending need for gearing readjustment;

h. A third sensory indicant means operative by at least one signal derived from the said processing logic unit output to provide for the operator a distinctive indication of the abusive operation of the clutch means.

4,150,498

FOOT COVER AND BLANK THEREFOR

Alfred M. Palmer, Independence, La., assignor to Peds Products, Inc., Riverside, Calif.

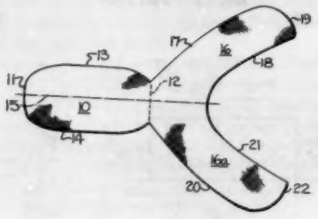
Filed Nov. 28, 1977, Ser. No. 855,203
Int. Cl.[2] A43B *3/10, 19/00*
U.S. Cl. 36—10 **4 Claims**

1. A foot cover formed of a one-piece blank of stretchable material and comprising

(a) an elongate sole portion symmetrical about a longitudinal center line and including opposite side edges, and heel and toe ends at opposite ends thereof, said heel end being curved and joining said opposite side edges,

(b) an upper portion including a medial toe covering portion integral with and extending upwardly from said toe end of said sole portion, and elongate side and heel portions including inner ends integral with and extending rearwardly from said toe covering portion, said elongate side and heel portions including first side edges adjacent said opposite side edges of said sole portion and second side edges spaced above said first side edges and defining a foot receiving opening, said elongate side and heel portions including outer ends extending upwardly in adjacent relationship from the middle of said heel end of said sole portion,

(c) first seam means connecting said first side edges of said side and heel portions to said opposite side edges of said sole portion and said heel end thereof, and



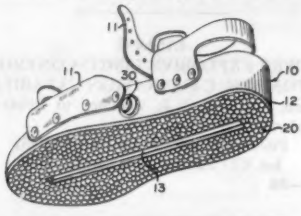
(d) second seam means connecting said adjacent outer ends of said side and heel portions and extending upwardly from said first seam means to the foot receiving opening defined by said second side edges of said elongate side and heel portions.

4,150,499

SHOE WITH ATTACHABLE AND INTERCHANGEABLE SKATE ACCESSORIES

Tec T. T. Wang, No. 24, 4th Fl., Ren Ai Rd., Sec. 1, Taipei, Taiwan

Filed Oct. 3, 1977, Ser. No. 838,943
Int. Cl.[2] A43B *5/04, 3/24*
U.S. Cl. 36—115 **7 Claims**



1. A construction for a shoe adapated for selective use with one of a plurality of skating means, comprising:

a sole having a side, forward and rear ends and a longitudinal slot defined therein, said slot being spaced from said sole forward and rear ends;

a catch means fixed on said sole and including a bore extending transversely of said sole from said sole side and connecting with said longitudinal slot, a locking member slidably positioned within said bore and movable from a locking position extending transversely across said slot obstructing said slot into an unlocking position to one side of said slot, yieldable means urging said locking member into said locking position, and operating means connected to said locking member and located outside of said bore for moving said locking member into said unlocking position against the urging force of said yieldable means; and

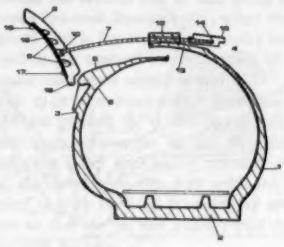
a mounting plate on a skating means and dimensioned to be received in said slot for detention therein and having a locking hole defined therein for receiving said locking member to attach said mounting plate to said sole whereby a skating means is attached to the shoe when said locking member is in said locking position.

4,150,500

MOLDED BOOT

Marc G. Delery, Caluire, France, assignor to Trappeur, Saint Laurent Du Pont, France

Filed Dec. 19, 1977, Ser. No. 862,280
Claims priority, application France, Dec. 20, 1976, 76 38997
Int. Cl.[2] A43B 5/04, 11/00; A43C 11/00
U.S. Cl. 36—117 13 Claims



1. A molded plastics material boot comprising, in combination:

a. a rigid sole;

b. a rigid shell upper integral with said sole;

c. first and second relatively movable portions of said shell upper enabling said shell upper to be closed on a wearer's foot;

d. at least one closure element for clamping said portions in a closed position, each said closure element comprising:

(i) a closed loop having first and second ends, the first end being connected to said first portion;

(ii) a lever pivotally mounted on the second end of the loop and comprising a plurality of parallel grooves formed in said lever, a transverse portion of said loop at the second end thereof engageable selectively in one of said parallel grooves to mount said lever pivotally and a flexible cover plate engaged over said grooves;

(iii) a fixed seat molded onto said second portion; and

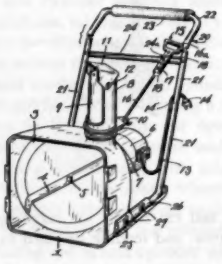
(iv) an end on said lever engageable in said fixed seat, said lever being pivotable after engagement in said seat effective to tighten said loop.

4,150,501

HANDY SNOW PLOUGH

Yoshitsugu Hayashi, Gyoda, Japan, assignor to More Corporation, Tokyo, Japan

Filed Oct. 19, 1977, Ser. No. 843,618
Claims priority, application Japan, Feb. 9, 1977, 52-14426[U]
Int. Cl.[2] E01H 5/00
U.S. Cl. 37—43 B 14 Claims



1. A mobile snow plough comprising:

at least one main body having a generally box-like configuration and an open front end;

a drive shaft mounted rotatably and horizontally within said body;

a snow collecting and propelling blade carried by said drive shaft for rotation therewith;

a prime mover means for driving said drive shaft;

a snow discharge pipe mounted rotatably on said body and adapted to receive snow propelled by said blade and to discharge said snow in a selected azimuthal direction; and

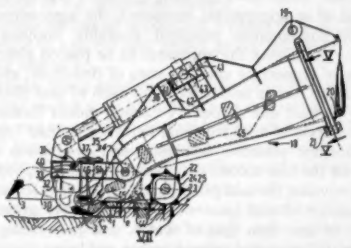
adjusting means for selectively fixing said discharge pipe in any one of a plurality of horizontal angular settings to thereby determine the horizontal direction in which the snow is discharged, said adjusting means comprising a handle and a lever releasably connected between said pipe and said handle, said lever having a plurality of apertures extending longitudinally spaced relation therealong, and pin means carried by said handle positionable in a selected one of said apertures.

4,150,502

METHOD AND APPARATUS FOR BREAKING UP LUMPS OF STONE FROM A SUBAQUEOUS SOIL

Jan Piet t. Sijthoff, Amstelveen, Netherlands, assignor to Ballast-Nedam Groep N.V.; Amsterdamse Ballast Bagger en Grond and B.V. en Scheepswerf en Machinefabriek "de liesbosch" B.V., all of Amsterdam, Netherlands

Filed Dec. 16, 1976, Ser. No. 751,194
Claims priority, application Netherlands, Dec. 19, 1975, 7514881
Int. Cl.[2] E02F 3/88
U.S. Cl. 37—58 15 Claims



1. A suction dredger assembly for dredging subaqueous stony ground, comprising in combination:

suction tube means adapted to be attached at one end to a dredger hull and having a suction head defining a suction mouth at its other end;

freely rotatable means carried by said suction head for supporting at least a portion of the weight of the suction dredger assembly on the surface of the subaqueous ground whereby to bear upon the ground surface and to position said suction mouth above such surface so that it moves along over the surface along a path determined by movement of the hull, said freely rotatable means being positioned forwardly of said suction mouth and including a freely rotating member having transversely disposed and uniformly circumferentially spaced penetrating means which, by virtue of the bearing weight, penetrate the ground to a first depth successively along lines which are transverse to said prescribed direction and are uniformly spaced in said prescribed direction and which successively vertically fracture the ground along such lines at least to a predetermined second depth substantially greater than said first depth; and

chisel means carried by said suction head below said suction mouth and behind said freely rotatable means for horizontally shearing the ground at a level corresponding to said second depth below the surface thereof to which the vertical fracturing reaches.

4,150,503

APPARATUS FOR EXCAVATION AND EARTH REMOVAL FROM AQUATIC BOTTOMS

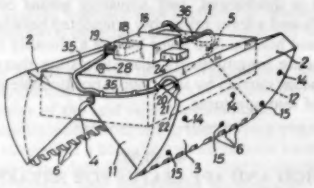
Pierre Lespinasse, 34, Rue du Lycee, 92330 Sceaux, France

Continuation-in-part of Ser. No. 592,454, Jul. 2, 1975, abandoned, which is a continuation of Ser. No. 390,417, Aug. 22, 1973, abandoned. This application Jan. 17, 1977, Ser. No. 759,976

Claims priority, application France, Aug. 22, 1972, 72 29897

Int. Cl.[2] **E02F** *3/44;* **B63C** *7/20*

U.S. Cl. 37—71 **8 Claims**



1. In a floatable apparatus having propulsion means and at least two jaws or grippers, suitable for use as a clamshell bucket or the like, articulated with respect to one another around at least two coaxial pivots, suspended from caisson means and operatively arranged so that in a closed position of said jaws, these jaws define means for transport of materials and in an open position these jaws constitute, when resting on top of material, instrumentalities for removal of at least a portion thereof, which jaws mutually approach one another upon execution of an appropriate command, the inprovement comprising in combination: principal, floatable, buoyant caisson means for permitting the apparatus to be placed alternatingly in a state of immersion and in a state of floatation, and floatation chamber means associated with each of said jaws constituted by at least one secondary caisson means formed in the hollow interior of said jaws and carrying at least one orifice and means for selective admission and evacuation of compressed air for said secondary caisson means independently of any air provided for said principal caisson means for achieving a net density of said jaws which is selectably greater than, equal to or less than that of water, said jaws being carried solely by said principal caisson means and being so connected that either of said jaws and its respective floatation chamber always move together, in the same direction, and on the same side of a vertical plane bisecting said coaxial pivots; and means for admitting compressed air to said principal and secondary caissons, and wherein said principal caisson means has at least one water-tight compartment intended to receive a compressed air charge, said water-tight compartment has an orifice at a lower portion thereof for permitting the passage of water to and from said principal caisson and said compartment is connected to said means for admitting compressed air whereby opening and closing of the jaws is effected by air and water fed selectively into the floatation chambers of said jaws, immersion is effected by water fed into said principal caisson and closing of the jaws is effected by water being let into said floatation chambers of said jaws while air is fed into said principal caisson means.

4,150,504

STABILIZED DIGGING MECHANISM

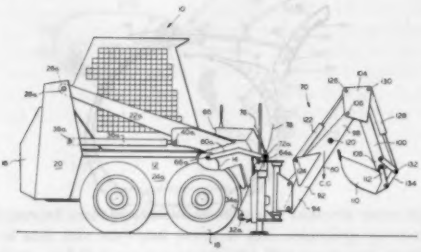
James E. Asche, Milnor, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 7, 1978, Ser. No. 875,823

Int. Cl.[2] **E02F** *5/02, 3/00*

U.S. Cl. 37—103 **9 Claims**

1. In a mobile vehicle of the type which includes a main frame, a lift arm having a first end that is pivotally attached to said main frame on a horizontally disposed first pivot axis and having a second end, first fluid actuator means for lifting said second end of said lift arm, a tilt frame being pivotally attached to said lift arm proximal to said second end thereof on a second pivot axis that is substantially parallel to said first pivot axis, second fluid actuator means for tilting said tilt frame about said second pivot axis with respect to said lift arm, and implement means being attached to said tilt frame for performing work in response to actuation of said lift arm and said tilt frame by said first and second fluid actuator means, the improvement which comprises:



second implement means, having a weight with the center of gravity thereof disposed longitudinally outward from said pivotal attachment of said tilt frame and being removably securable to said tilt frame when first said implement means is not attached thereto, for performing work without actuation of either of said fluid actuator means; and

stabilizer means for preventing said weight of said second implement means from rotating said tilt frame about said pivotal attachment thereof without dependence upon said second fluid actuator means.

4,150,505

BIRD TRAP AND CAT FEEDER

Leo O. Voelker, Linn, Kans. 66953

Filed Aug. 8, 1977, Ser. No. 822,683

Int. Cl.[2] **A01M** *23/04;* **A01K** *39/01*

U.S. Cl. 43—69 **7 Claims**

1. A bird trap and cat feeder for catching a bird and in particular, a sparrow, and feeding the bird to a cat, the trap comprising:

an enclosed bird housing having an upper portion, a tapered lower portion, a back, a front, a top, an open bottom, and sides;

an entrance hole mounted in the side of the upper portion of said housing for receiving the bird therethrough;

a glass window mounted in an opening in the tapered lower portion of the front of said housing;

a balanced pivot tube pivotally mounted on a pivot pin inside said housing, a first end of said pivot tube is attached to a balance weight for balancing said tube in a horizontal position, a second end of said tube is disposed adjacent and below said entrance hole for receiving the bird thereon, the second end of said pivot tube with the bird thereon lowered downwardly, when the second end of said pivot tube is lowered downwardly the second end is disposed in the tapered lower portion of said housing and adjacent said glass window; and

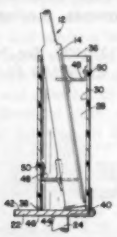
a wire mesh cage communicably connected to the open bottom of said housing for receiving the bird therein, said wire mesh cage dimensions so that the openings in the wire mesh are small enough to prevent the bird from escaping, the openings in the wire mesh are large enough for the bird to stick his head through the openings in the wire mesh so that the cat can quickly pull the bird out of said cage with his paw.

4,150,506

FISHING ROD HOLDER

Charles P. McGinnis, deceased, late of Anaheim, Calif., by Alice M. McGinnis, administratrix, 1400 S. Douglas Rd. #124, Anaheim, Calif. 92806

Filed May 23, 1977, Ser. No. 799,146
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 **5 Claims**



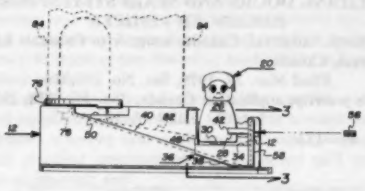
1. A fishing rod holder for use with a fishing rod having a handle adjacent one end thereof, comprising a rigid substantially flat platform having an upper surface and a lower surface, a spike fixedly secured to said lower surface of said platform, the longitudinal axis of said spike being substantially perpendicular to said lower surface, a hollow double open-ended cylinder forming a longitudinal chamber therein, said cylinder having a first open end and a second open end, said second end of said cylinder hingedly affixed to said upper surface of said platform, said second end of said cylinder being disposed in a use position when the longitudinal axis of said cylinder extends normal to said upper surface of said flat platform whereby said second end of said cylinder rests upon said upper surface of said flat platform forming a fishing rod handle holding chamber having the only one open end remaining located at said first end of said cylinder, said longitudinal axis of said cylinder being pivoted away from said use position into a fishing rod handle insertion position whereby said longitudinal axis of said cylinder forms an acute angle with said upper surface of said platform, means for releasably retaining said handle of said fishing rod in said cylinder when said handle is inserted into said longitudinal chamber through said first end of said cylinder whereby the longitudinal axis of said handle is at an acute angle to said longitudinal axis of said cylinder, said retention means including at least one semi-resilient element fixedly secured to a surface forming said handle holding chamber.

4,150,507

TOY FOR LOADING A VEHICLE

Toyotsugu Ogasawara, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,569
Claims priority, application Japan, Jun. 4, 1976, 51-72814
Int. Cl.[2] A63H *15/02*
U.S. Cl. 46—40 **9 Claims**



1. A toy including a loading station, a vehicle capable of moving past and adjacent to one side of said loading station and an object which is adapted to be transferred from said loading station to said vehicle when said vehicle is adjacent to said side of said loading station in which the improvement comprises:

an inclined ramp located on said loading station adjacent to said side thereof,

a carrier located on said inclined ramp so as to be capable of being elevated from adjacent to the lower end thereof to adjacent to the upper end thereof,

said carrier including a platform located thereon which is adapted to support said object as said carrier is elevated along said ramp,

said vehicle being capable of moving along said side of said loading station so as to initially pass said lower end of said ramp and to continue past said upper end of said ramp,

a shelf located on said vehicle at such a height as to be capable of receiving said object from said platform as said carrier is elevated along said ramp, and

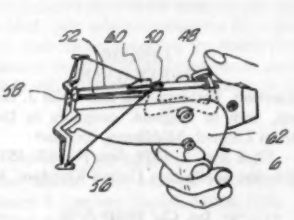
cooperating motion coupling means located on said vehicle and on said carrier which engage one another as said vehicle moves past and adjacent to said side of said loading station for elevating said carrier to a position such that said object can move to said shelf.

4,150,508

VEHICLE TOY WITH FIRING MECHANISM

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,538
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—202 **13 Claims**



1. A combination mobile toy and projectile firing device comprising;

a body member having a simulated operator seat;

a cross bar member extending outward from either side of the body member and positioned to simulate a foot rest for an operator;

a plurality of appended members attached to the body member to provide locomotion, and

means operatively associated with the cross bar member for projecting a projectile.

4,150,509

SLIDING DOORS AND SEALS SYSTEM FOR PASSENGER VEHICLE

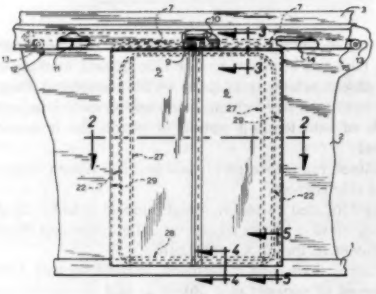
Joseph Knap, Montreal, Canada, assignor to Canadair Limited, Montreal, Canada

Filed Mar. 27, 1978, Ser. No. 890,316

Claims priority, application Canada, Jan. 24, 1978, 295686

Int. Cl.[2] E05F *17/00*

U.S. Cl. 49—123 **9 Claims**



1. A sliding doors and seals system comprising a side wall having a passageway aperture therethrough and a pair of side wall edge portions extending along the laterally opposite edges of said paasageway aperture, a pair of doors slidable edgewise to and fro relative to each other longitudinally and externally of said side wall, said doors cooperatively having a combined width exceeding the width of said passageway aperture and overlapping said side wall edge portions respectively in any position of said doors along said to and fro opening and closing displacement thereof, inflatable seals fixed against the external side of said wall, including at least two separate elongated sections complementarily coextensive with the full periphery of said passageway aperture, and defining a pair of lateral portions vertically extending against said lateral edge portions respectively of said side wall and remaining covered by the overlapping of said lateral edge portions by the doors respectively for any position of the doors along said to and fro opening and closing displacement thereof.

4,150,510

SAFETY GATES

Frank B. Harrison, Berkhamsted, and Colin J. Hornsby, Rickmansworth, both of England, assignors to Dexion-Comino International Limited, Middlesex, England

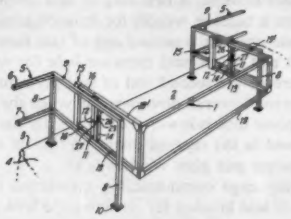
Filed Aug. 2, 1978, Ser. No. 930,451

Claims priority, application United Kingdom, Aug. 12, 1977, 33950/77

Int. Cl.[2] E05D *7/08*

U.S. Cl. 49—388 **7 Claims**

1. A safety gate of the kind set forth, comprising a supporting structure, a counterbalanced gate structure which consists of two side parts connected at one end by a fence part and which is pivotably mounted on the supporting structure by way of the said side parts to permit the gate structure to be swung between two end positions, and stop means pivotably mounted in relation to the supporting structure and automatically engageable with the supporting structure and by the side



parts of the gate structure for determining the said end positions.

4,150,511

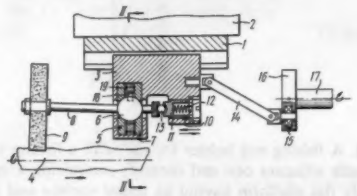
DEVICE FOR FINISHING SHAPED SURFACES WITH AN ABRASIVE TOOL

Vladimir N. Khokhulin, Okhtensky prospekt, 2v/17, kv. 75; Jury V. Ladygin, prospekt Narodnogo opolchenia, 121, kv. 65, and Valery G. Shver, Bolshoi prospekt, 104, kv. 24, all of Leningrad, Sr. U.S.S.R., assignors to Proizvodstvennoe Obiedinenie Turbostroenia Leningradsky Metallichesky Zavod, U.S.S.R.

Filed May 12, 1977, Ser. No. 796,441

Int. Cl.[2] B24B *19/14*

U.S. Cl. 51—67 **2 Claims**



1. A device for finishing shaped surfaces with an abrasive tool, comprising:

a fixed base;

a carriage movably mounted on said fixed base and reciprocably driven to perform a reciprocating motion relative to said base;

a drive for reciprocatingly driving said carriage;

a pivoting double-arm lever pivotally mounted in said carriage and having a first and a second arm;

a spherical bearing for said lever disposed in said carriage mounting said lever pivotally in said carriage;

an abrasive tool secured on a first arm of the said lever;

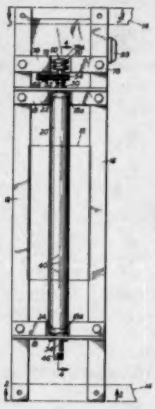
turning means for rotational turning of said first arm and abrasive tool about an axis thereof, and a hold-down member mounted in said carriage operatively connected with an end surface of said second arm of said lever effective to urge said abrasive tool to continuously engage the surface being machined and maintaining the axis of said hold-down member passing through the center of said spherical bearing of said lever;

thereby ensuring the a continous urging of said abrasive tool on to every point of contact with the surface being machined.

4,150,512
APPARATUS FOR CLEANING MOVING ABRASIVE MEMBERS

Walter M. Novak, P.O. Box 23279, Portland, Oreg. 97223

Filed Aug. 29, 1977, Ser. No. 828,266
Int. Cl.[2] B24B *55/00*
U.S. Cl. 51—262 A 5 Claims

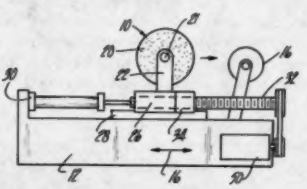


1. In combination,
(a) a sanding belt operating over end rollers and having a widened abrasive surface to be cleaned,
(b) an elongated hollow cylindrical housing arranged to be mounted adjacent to and substantially parallel with said abrasive surface of said sanding belt,
(c) said housing having a plurality of radial ports spaced longitudinally therein establishing communication between the interior and exterior of said housing,
(d) an elongated cylindrical core member rotatably supported within said housing in interior sealing surface engagement with said housing,
(e) a spiral groove in the surface of said core member of a selected width and pitch such that only a small number of ports are exposed to said groove at a time,
(f) fluid conducting means supplying pressured fluid to said groove to provide an outlet jet of fluid from said housing the width of the ports which are in communication with said spiral groove,
(g) and power means rotating said core member in said housing to provide repeating ones of said jets of fluid to travel across said housing upon rotation of said core member for cleaning the abrasive surface of said sanding belt.

4,150,513
METHOD FOR GRINDING

David L. Smith, Brighton, and Norman J. Scherr, Jr., Mt. Clemens, both of Mich., assignors to Inovex Corporation, Roseville, Mich.

Filed Aug. 16, 1976, Ser. No. 714,405
Int. Cl.[2] B24B *49/16*
U.S. Cl. 51—281 R 4 Claims

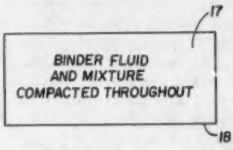


1. A method for grinding for use in conjunction with a grinding machine of the type comprising a first and second member, wherein one member is a circular grinding wheel adapted to rotate about its axis and the other member is a spindle adapted to hold a workpiece at a position linearly spaced from said grinding wheel, wherein one member is linearly movable relative to the other member and whereby said workpiece and the components of the grinding machine bend a predetermined amount as said grinding wheel is moved into said workpiece at a constant predetermined lineal rate, the improvement comprising the steps of:
deflecting said workpiece and said components said predetermined amount by contacting and rapidly advancing the movable member into the other member for said predetermined amount;
immediately thereafter advancing the movable member at said constant predetermined lineal rate toward the other member whereby said workpiece and said components of said grinding machine remain deflected said predetermined amount; and
thereafter rapidly retracting the movable member away from the other member so that the grinding wheel is moved out of contact with said workpiece when the diameter of said workpiece attains a predetermined size.

4,150,514
PROCESS FOR MOLDING BONDED REFRACTORY PARTICLES

Thomas E. Douglass, Woodbridge, Conn., assignor to Ferro Corporation, Cleveland, Ohio

Filed Oct. 28, 1977, Ser. No. 846,379
Int. Cl.[2] B24D *11/00*; C09K *3/14*
U.S. Cl. 51—298 14 Claims



1. A process for molding a refractory body of improved strength and prolonged useful life with a mold press while simultaneously increasing the production rate of said press, said process comprising placing in a mold form a mixture of refractory particles and an organic resinous binder that is present in sufficient amount to bind said particles one to another, subjecting the mixture and mold form to microwave energy in the absence of pressure on the mixture to preheat the mixture to a temperature at which the resinous binder is fluid, then transferring the preheated mold form and mixture to a press, compacting the mixture in said mold form to a predetermined, desired density substantially equal to the density of the ultimately molded body while maintaining the resinous binder in a fluid state, and then converting the resinous binder to a solid state effective to bind the particles one to another in said mold form while still maintaining said pressure on the mixture.

4,150,515
GUTTER STRUCTURE

Luciano Giulini, Milan, Italy, assignor to Cartec Costruzione Articoli Tecnici di Luciano Giulini, Milan, Italy

Filed Apr. 13, 1977, Ser. No. 787,217
Claims priority, application Italy, Apr. 13, 1976, 22256 A/76
Int. Cl.[2] E04D *13/00, 13/08*
U.S. Cl. 52—12 7 Claims

1. A gutter structure, comprising:
a plurality of gutter lengths having upwardly extended sides with curled or similarly bent top edges; and
a plurality of coupling elements into which the ends of said

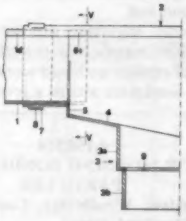
gutter lengths are inserted, in close contact with the inner walls thereof, at least one of said coupling elements being of the downspouting type;

wherein said coupling elements of the downspouting type include

end extensions having a shape complementary to that of said gutter lengths, into which the ends of adjacent ones of said gutter lengths are slidingly fitted, the length of said extensions being such as to be able to take up the total longitudinal thermal expansions of a plurality of said gutter lengths that are fixedly connected to one another, each of said end extensions having transversely directed grooves packed with sealing packing;

a downspouting fitting; and

a recessed floor between said end extensions and on either side of said downspout fitting, said recessed floor comprising a substantially rectangular portion stepped



below the level of each said end extension and extending longitudinally from said downspout fitting to each said end extension, each said longitudinally recessed portion being inclined downwardly from said step to said downspout fitting, wherein the length of each said longitudinally recessed portion in said longitudinal direction is substantially greater than that of said downspout fitting and the width of each said longitudinally recessed portion in the transverse direction is substantially the same as that of said downspout fitting, such that the ones of said gutter lengths fitting into said respective end extensions will overhang said recessed portions at maximum extension without overhanging said downspout fitting,

whereby the sliding of the ends of said gutter lengths is facilitated and a downflow of water directed toward said downspout fitting is caused without occluding said fitting.

4,150,516

FRAMEWORK AND SHEET MATERIAL BUILDING STRUCTURE

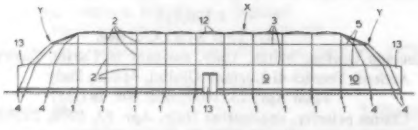
George A. Wemyss, 2 Mitchell's Close, Haddington, E. Lothian, Scotland

Filed Nov. 10, 1977, Ser. No. 850,252

Claims priority, application United Kingdom, Nov. 12, 1976, 47326/76; Mar. 7, 1977, 9545/77

Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—86 24 Claims



1. In a building structure made up from a framework covered by a sheet material, the building structure having a generally rectangular floor plan, the framework being composed of a plurality of interconnected parallel arches which extend at right-angles to an axis of symmetry of the floor plan of the building structure, the arches being joined together by means of cross-pieces to form a tunnel having two ends closed by an end structure, and the sheet material being connected to the framework under tension, the combination comprising:

(a) each said arch having at least four identical, rectilinear struts joined end-to-end,

(b) each said cross-piece is of substantially identical form to said identical struts, and

(c) a respective strip of said sheet material is connected between each pair of adjacent arches,

(d) the width of each said strip being slightly less than the corresponding spacing between the arches, whereby the strips are tensioned transversely.

4,150,517

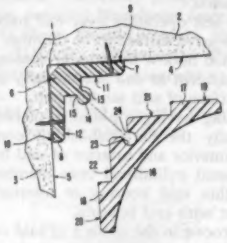
REPLACEABLE CORNER MOLDING

Robert L. Warner, Sr., 6395 Lake "O" Springs Ave. NW., Canton, Ohio 44718

Filed Dec. 27, 1977, Ser. No. 864,543

Int. Cl.[2] E04D *1/36;* E04C *1/39*

U.S. Cl. 52—288 1 Claim



1. A replaceable corner molding for a corner formed by two walls each having a substantially planar surface meeting the other substantially perpendicularly, said molding comprising

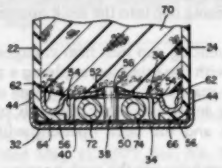
a base member consisting of an elongated strip affixed to the meeting walls, said base member having a substantially L-shaped cross-section having a pair of legs meeting each other at substantially right angles, each of the legs having an outer surface abutting a corresponding one of the walls and an inner surface meeting the other at the inside of said base member, said base member having a projecting strip extending from the inner surfaces of the legs thereof at their area of intersection and equiangularly spaced from said inner surfaces and a head strip of substantially circular cross-section at the free end of the projecting strip farthest from the base member; and

a molding member consisting of an elongated strip of substantially L-shaped cross-section having a pair of legs meeting each other at substantially right angles, each of the legs having an outer surface partially abutting a corresponding one of the walls with indentations therein for accommodating the inner surfaces of the legs of the base member, said molding member having a slot of substantially circular cross-section extending along its length at the area of intersection of the legs thereof, equiangularly spaced from the outer surfaces of the legs of said molding member for accommodating the head strip of the projecting strip of said base member, said slot having a narrow neck part whereby the head strip of said projecting strip is releasably secured in said slot.

4,150,518
MULLION MOUNTING

Curtis A. Truesdell, 10676 W. Baker Rd., and Larry F. Wilson, 10621 Velma Dr., both of Greenville, Mich. 48838

Filed Feb. 21, 1978, Ser. No. 879,354
Int. Cl.[2] B65D *25/00*
U.S. Cl. 52—804 5 Claims

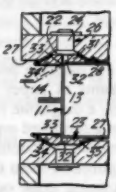


1. Means for attaching an outer U-shaped strip to bridge the space between the edges of two essentially parallel spaced apart wall structures having inturned end flanges at their outer extremities, said end flanges being essentially perpendicular to said wall structures comprising: first clip means secured to said strip, second clip means having spaced apart leg portions extending essentially perpendicular to said wall structures and engageable, respectively, with the inner and outer surfaces of said inturned end flanges of said wall structures to thereby retain said second clip means against movement in a direction parallel to said wall structures, and connecting means carried by one of said clip means and frictionally engageable with the other clip means to hold said first and second clip means in assembled relation to thereby retain said cover strip in bridging relation to said wall structures, and said strip having side flanges engageable with said wall structures to hold said wall structures against movement away from each other.

4,150,519
PACKAGING APPARATUS

Walter I. Akkala, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed May 10, 1978, Ser. No. 904,377
Int. Cl.[2] B65B *43/30;* B31B *11/00*
U.S. Cl. 53—175 10 Claims

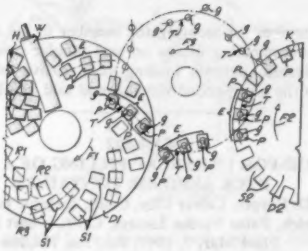


1. In means for handling a flattened pouch having opposed planar walls joined along side portions thereof to define an opening for receiving material to be packed, the combination comprising: a pair of opposed vacuum box means mounted for movements toward and away from one another; means disposed on each said vacuum box means defining a pair of mutually spaced vacuum ports in fluid flow communication with a corresponding one of said vacuum box means, each said port being defined in part by at least one elongate edge portion extending transversely of said opening, parallel to the edge portion defining a part of an opposed port, and in the direction of a corner fold to be formed in a pouch; means for moving said vacuum box means toward one another into position engaging the recited walls of a flattened pouch in the region of its opening; means for introducing a vacuum through said vacuum ports upon engagement of said pouch walls by said vacuum box means to urge portions of said pouch walls over said vacuum port edges to initate formation of a crease in said pouch walls extending in the direction of a desired corner fold; and means for moving said vacuum box means apart to urge said pouch walls apart to positions causing said creases to extend along regions of said pouch walls beyond the recited initially formed creases, thereby to form said corner folds for shaping said pouch in a substantially rectangular cross-sectional configuration.

4,150,520
DEVICE FOR FEEDING ARTICLES

Angelo Palmieri, Zola Predosa, and Sandro Salicini, Bologna, both of Italy, assignors to Carle & Montanari S.p.A., Bologna, Italy

Filed Jan. 25, 1978, Ser. No. 872,141
Claims priority, application Italy, Jan. 26, 1977, 12435 A/77
Int. Cl.[2] B65B *11/28*
U.S. Cl. 53—225 4 Claims



1. A device for feeding articles, particularly adapted for feeding articles to a wrapping or packaging machine, comprising:

(a) a first disc or conveyor disc, arranged horizontally and rotating about a vertical axis, said conveyor disc presenting a plurality of concentrical crowns of pockets, each pocket of a crown being adapted to receive an article and being arranged on the said conveyor disc, with respect to a corresponding pocket of each one of the other concentric crowns, so as to form a set of pockets arranged on an arc of circumference having a predetermined diameter;

(b) a second disc or feeding disc, arranged horizontally and rotating about a vertical axis, said feeding disc presenting at least one crown of receiving pockets arranged on a circumference having a diameter equal to the said above mentioned predetermined diameter;

(c) rotary transfer device arranged between the said conveyor disc and the said feeding disc, said rotary transfer device comprising a plurality of grippers angularly equispaced and rotating around a vertical axis, each gripper being adapted to take out a set of articles positioned in a set of pockets on the conveyor disc and to deposit same, without modifying the relative position of the articles, in the receiving pockets provided on an arc length of the crown of receiving pockets of the feeding disc.

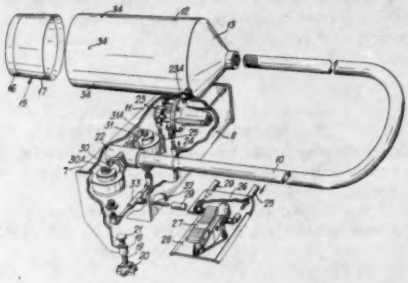
4,150,521
PACKAGING APPARATUS

John Reilly, 278 Killaughey Rd., Donaghadee, County Down, Northern Ireland

Filed Jan. 12, 1978, Ser. No. 868,838
Int. Cl.[2] B65B *39/06;* A22C *11/06*
U.S. Cl. 53—258 9 Claims

1. A packaging apparatus comprising a cylinder having an open mouth at one end, a freely movable piston slidably mounted within the cylinder, a rigid tubular member whose cross-sectional area is less than that of the cylinder, said tubular member being connected at one end to that end of the cylinder

remote from the mouth and adapted at its other end for connection to a source of compressed air for actuation of the piston, a support means at or adjacent the other end of said



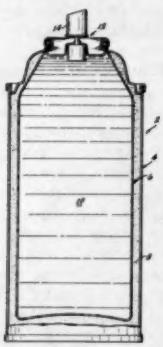
tubular member for securing the member to the support, and releasable connecting means on said tubular member which, when released, permits loading of a sleeve of elasticated netting in the unexpanded state around said tubular member.

4,150,522

METHOD FOR UNDERCAP FILLING OF A BARRIER PACK AEROSOL CONTAINER

Norman D. Burger, Culver City, Calif., assignor to Nicholas A. Mardesich, Palos Verdes Estates, Calif., a part interest

Filed Mar. 7, 1977, Ser. No. 774,896
Int. Cl.[2] B65B *31/04*
U.S. Cl. 53—470 **14 Claims**



1. A method for pressurizing an aerosol dispensing system with propellant, which dispensing system includes a flexible inner container having a mouth opening, a rigid outer container having a narrowed neck opening, the inner container positioned within the outer container, a dispensing cap joined to the neck opening of the outer container with the cap in communication with the inner container, and a propellant in the region between the exterior of the inner container and the interior of the outer container to exert pressure on the exterior of the flexible inner container, said method comprising:

inserting the flexible inner container within the rigid outer container with the mouth opening of the inner container extending outward through the neck opening of the outer container;

said inner container having flexible means extending around said mouth opening;

supporting said flexible means on the neck opening of the outer rigid container;

placing the dispensing cap for the aerosol system in alignment with the neck opening of the outer container;

moving the dispensing cap relative to the flexible means on the mouth opening to firmly engage the flexible means with the exterior surface of the dispensing cap;

moving the dispensing cap away from the neck opening of the outer container with the flexible means in engagement with the exterior surface of the dispensing cap;

injecting propellant through the neck opening of the outer container into the region between the exterior of the inner container and the interior of the outer container;

moving the dispensing cap into the neck opening of the outer container;

crimping the dispensing cap into firm engagement with the neck opening with the crimping applying a gripping force to the flexible means to fix the position of the flexible means and the inner container through contact of the dispensing cap and the neck opening with the flexible means, and

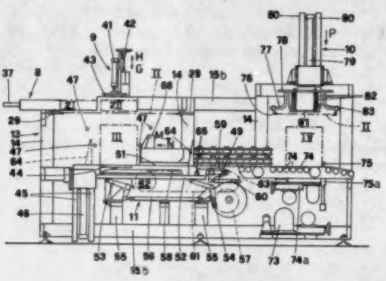
maintaining a space between the neck opening and a portion of the exterior surface of the dispensing cap during said crimping to prevent tearing of the flexible inner container during the crimping operation.

4,150,523

AUTOMATIC MACHINE FOR PACKING PRODUCTS OF PARALLELEPIPED SHAPE, PARTICULARLY REAMS OF PAPER

Vittorio Gentili, Bologna, Italy, assignor to Wrapmatic S.p.A., Bologna, Italy

Filed Nov. 15, 1977, Ser. No. 851,793
Claims priority, application Italy, Nov. 15, 1977, 41679 A/77
Int. Cl.[2] B65B *35/40, 11/26*
U.S. Cl. 53—535 **12 Claims**



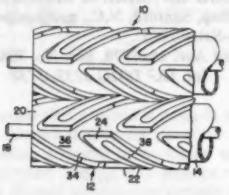
1. Automatic machine for packing products of parallelepiped shape, particularly reams of paper, essential features of which are that it comprises: a magazine for the boxes (5) and a magazine for the lids (6) in a flattened configuration; a line (7) for infeeding the parallelepiped products; means for moving a bbox in its flattened configuration from the relevant magazine to an almost coplanar charging zone outside the said infeed line; pusher means (8) for transferring the products from the infeed line exit to the central area of the box; a presser (9) that acts vertically on the products arranged in the central area of the box to push downwards the box and products a distance corresponding to the height of the said products; fixed lateral locators (47) which, with the step by step downward motion brought about the presser, cause the front (3*b*) and the rear (3*c*) sections of the box to be folded upwards; two spatulas (50) rotatable around vertical shafts, operated subsequently to the lowering of the box, and able to fold downwards the flaps (3*h*) and (3*i*) of the said rear section with respect to the advancement direction; a line for moving forward the said boxes, on the sides of which are positioned fixed locators (66) and (68) for causing, as the boxes advance in the direction shown as (F), the folding back of the said flaps (3*f*) and (3*g*) of the front section (3*b*), and the folding upwards of the said lateral sections (3*c*) and (3*d*), means being provided for distributing the glue (67) over the said lateral sections; a number of opposite rollers (12) arranged at the sides at the infeed line exit, for pressing the

said lateral sections against the said flaps in order to permit them to be reciprocally glued; means for moving a lid in its flattened configuration from the relevant magazine to an area overlying the exit from the said set of rollers; a presser (10) for pressing downwards the said lid, this being provided with a plurality of rungs (77), curved downwards and various heights, for causing the subsequent folding of the sections and flaps of the lid after the central area of this has been located over the products, means (84) being provided for distributing the glue over the said flaps.

4,150,524
CROP CONDITIONER ROLL

Bobby G. Sawyer, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 12, 1977, Ser. No. 796,057
Int. Cl.[2] A01D *49/00*
U.S. Cl. 56—1 **10 Claims**

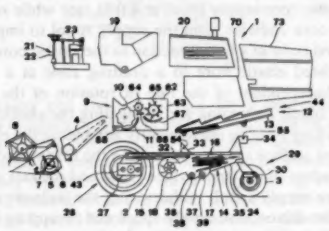


1. A crop conditioner roll for use in parallel intermeshing relationship with another similar roll and having an elongated generally cylindrical body and a plurality of spaced lugs of elastomeric material extending radially outwardly from the body and having arcuate outer surfaces generally coaxial with the core so that the outer surfaces conjunctively form an interrupted generally cylindrical outer periphery opposite the body of the other roll, characterized in that a recess is provided in the outer surface of at least some of the lugs to provide additional edges on the outer periphery of the roll, each recess having a non-intermeshing relationship with the opposite roll.

4,150,525
COMBINE HARVESTER

Cyriel R. J. De Busscher, Sijsele; Marcel A. Dekeyzer, Brugge, and François van Herpe, Vlierzele, all of Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed May 4, 1977, Ser. No. 793,582
Claims priority, application United Kingdom, May 11, 1976, 19221/76
Int. Cl.[2] A01D *41/06*
U.S. Cl. 56—14.6 **15 Claims**



1. A harvesting machine made of a plurality of sub-assemblies connected together, comprising:

a mobile sub-assembly having a front end and a rear end, a pair of front wheels and a pair of rear wheels interconnected by a framework forming a chassis for the machine;

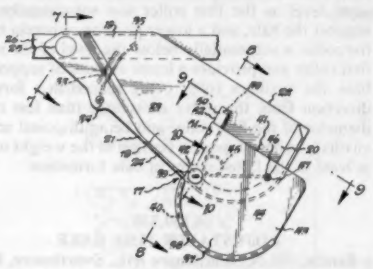
a separate, self-contained, self-supporting sub-assembly mountable atop the rear end portion of the mobile sub-assembly and having straw walkers rotatably mounted on a pair of straw walker shafts; and

mounting means on the mobile sub-assembly for mounting the separate, self-contained, self-supporting sub-assembly on the mobile sub-assembly.

4,150,526
COLLECTOR LEAF CONSTRUCTION FOR HARVESTING MACHINE

Charles G. Burton, Lewiston, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,398
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—329 **18 Claims**

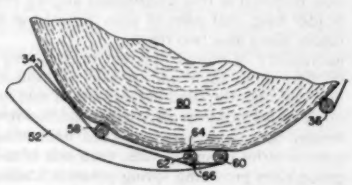


1. A collector leaf for a harvester comprising a primary leaf portion having a leading edge and a trailing edge and an inboard portion and an outboard portion, first mounting means on said inboard portion for pivotally mounting said primary leaf portion on a harvester, a secondary leaf portion having an inboard portion and an outboard portion and a leading edge and a trailing edge, second mounting means for mounting said secondary leaf portion on the outboard end of said primary leaf portion with said inboard portion of said secondary leaf portion and said outboard portion of said primary leaf portion being in relative overlapping relationship with said leading edge of said secondary leaf portion extending forwardly of said leading edge of said primary leaf portion in the area of said overlapping relationship, said second mounting means including means for permitting said secondary leaf portion to move toward said trailing edge of said primary leaf portion when said leading edge of said secondary leaf portion engages a foreign object during forward movement of said harvester.

4,150,527
MACHINE FOR FORMING CYLINDRICAL HAY BALES

Gerald F. Meiers, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 5, 1977, Ser. No. 812,646
Int. Cl.[2] A01D *43/02*
U.S. Cl. 56—341 **2 Claims**



1. In a machine for forming cylindrical bales of crop material and having a mobile frame including a shiftable gate assembly and opposite upright sides forming a baling chamber therebe-

tween, a plurality of transverse rollers including a first roller carried by the gate assembly and a second roller spaced forwardly of the first roller, an endless belt means trained around the rollers and having a lower forwardly moving bale engaging run in the baling chamber between the first and second rollers, crop delivery means for removing crop material from the ground and delivering it to the baling chamber so that it is engaged by the bale engaging run of the belt means and rolled in spiral fashion into a cylindrical bale with the first roller disposed below and at least partially supporting the weight of the bale at least in the latter stages of its formation, the improvement comprising:

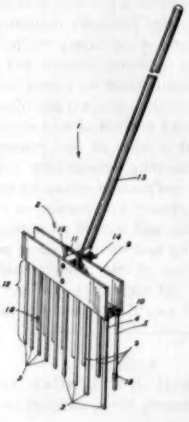
an auxiliary roller; and adjustable mounting means rotatably supporting the auxiliary roller on the rear gate assembly parallel and rearwardly proximate to the first roller for adjustment of the auxiliary roller between an upper position, wherein the top of the roller is at approximately the same level as the first roller and substantially helps to support the bale, and a lower position, wherein the top of the roller is substantially below the level of the top of the first roller and provides a lesser amount of support for the bale, the auxiliary roller being spaced in a fore and aft direction from the roller a distance than less twice the diameter of the first roller and being disposed so that the auxiliary roller supports a portion of the weight of the bale at least in the latter stages of bale formation.

4,150,528

ADJUSTABLE TINE RAKE

Larry Rendin, 508 N. Swarthmore Ave., Swarthmore, Pa. 19081

Filed Aug. 26, 1977, Ser. No. 828,022
Int. Cl.[2] A01D *7/04*
U.S. Cl. 56—400.19 **2 Claims**



1. An adjustable tine rake combination comprising:

a U-channel rake header having a required length, said header having a multiplicity of opposed aligned pairs of slots disposed in two longitudinal aligned rows along the header base, said pairs of slots disposed at specified distances along said two rows,

a multiplicity of paired opposed tines having a U-hairpin configuration, each one of said multiplicity of paired opposed tines disposed in each one of said multiplicity of opposed pairs of slots disposed in said two rows along said header base, said paired opposed tines being formed of narrow strips of spring steel, each one of said paired opposed tines providing spring pressure loading to the opposed pair of slots in which said paired tines are disposed,

a single tine frame support disposed along and permanently secured to all the multiple tines at the U-bend of the paired opposed tines, said frame support having a support handle suitable for regulating the relative position of said frame support and said rake header, said support handle centrally disposed in said frame support,

and,

a rake handle secured to said rake header, said rake handle centrally disposed along said header length, normal to said header length,

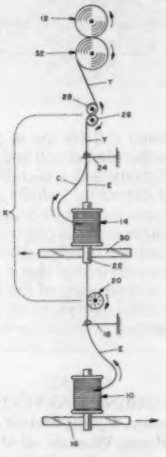
whereby, said tine support frame can be utilized to adjust said multiplicity of tines for stiffness by adapting the length of said tines disposed below said rake header.

4,150,529

METHOD OF MAKING ELASTIC YARN

Francis B. Northup, Sanford, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Apr. 14, 1978, Ser. No. 896,282
Int. Cl.[2] D02G *3/32, 3/38*
U.S. Cl. 57—6 **8 Claims**



1. The method of forming a balanced, single cover, elastic yarn from an untwisted inelastic cover strand wound upon a first supply spool mounted upon a driven, tubular spindle, and an untwisted elastic core wound upon a supply spool mounted upon a driven spindle including the steps: positively rotating the elastic core supply spool at a first rate while removing the elastic core endwise from the supply spool to impart a predetermined twist in a first direction to the elastic core, advancing the twisted elastic core to a drafting zone at a first surface speed independent of the rate of rotation of the elastic core supply spool, tensioning and elongating the elastic core within the drafting zone by subsequently advancing the elastic core at a second surface speed greater than the first surface speed, and independent of the first surface speed and the rate of rotation of the core supply spool, withdrawing the inelastic cover strand from the driven first supply spool and wrapping helically the inelastic cover strand about the elastic core in the drafting zone and in a direction opposite to the twist in the elastic core while positively rotating the first supply spool at a rate independent of the rate of rotation of the elastic core supply spool and independent of the first and second surface speeds, at least partially relaxing the tension in the elastic core as the core emerges from the drafting zone, and winding the elastic yarn upon a spool.

4,150,530

METHOD AND DEVICE FOR CONTROLLING THE THREAD JOINING IN ROTOR SPINNING MACHINES

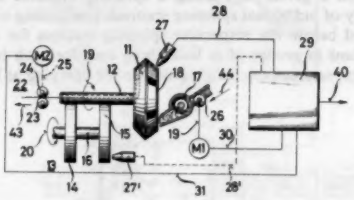
Josef Derichs, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 18, 1976, Ser. No. 658,895

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1975, 2507199

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—263 11 Claims



1. Method of controlling thread joining in a rotor-spinning machine, which comprises rotating the rotor of the spinning machine, introducing a thread to be joined into the rotating spinning-machine rotor, feeding fiber into the rotating rotor so as to form a ring thereof coming into contact with the thread so as to be joined thereto, withdrawing the joined thread from the rotating spinning-machine rotor, detecting the rotary speed of the spinning machine rotor at a given instant, and applying a pulse proportional to the rotary speed of the spinning machine rotor to control digitally a measure of the material being processed in the spinning operation, the pulse being produced contactlessly from parts of the spinning machine revolving at a speed proportional to the rotary speed of the rotor.

4,150,531

SPINNING AND TWISTING MECHANISM

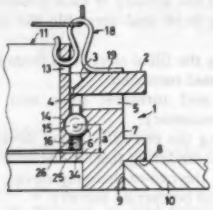
Angelo Marzoli, Palazzolo Sull'oglio, Italy, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 4, 1978, Ser. No. 893,117

Claims priority, application Italy, Apr. 13, 1977, 22430 A/77

Int. Cl.[2] D01H *7/56*

U.S. Cl. 57—124 7 Claims



1. A spinning and twisting device for a ring-supporting carriage of a spinning or twisting frame, comprising an annular cage having at least one direction of rotation around its axis and having seats, an annular stator body, and an annular rotor body rotatably coupled to said stator body, rolling members being inserted therebetween in a pair of throats mounted facing each other and formed through both said stator and said rotor bodies and being retained spaced apart circumferentially from each other by said annular cage, and braking means between said stator body and said rotor body, wherein said stator body has an annular bracket beneath said annular cage providing a sliding plane and said rolling members are loosely inserted in respective ones of said seats of said annular cage, each of said seats having, in the direction of rotation of the cage, a front side edge having a top portion sloping in a direction opposite to the direction of rotation and having an abutment land beneath said sloping portion, said throats having a center of curvature at a distance from the sliding plane of said annular bracket which is larger than the distance between a lower end of said sloping top portion and a bottom edge of said annular cage, and shorter than the distance between a top end of said sloping top portion and a lower edge of said annular cage.

4,150,532

THREAD TYING DEVICE FOR SPINNING FRAME

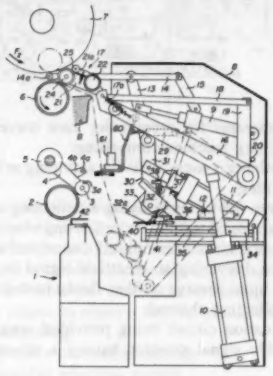
Hubert Ligones, St. Julien, France, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,385

Claims priority, application Switzerland, Nov. 11, 1976, 14210/76

Int. Cl.[2] D01H *15/00;* B65H *67/08*

U.S. Cl. 57—263 7 Claims



1. In a device for retying a yarn produced by an open-and spinning frame, in which the yarn is extracted through the outlet opening of a turbine by a drive shaft associated with a press roller, for winding on to a receiving spool driven by a second drive shaft, the device comprising a disengaging mechanism for the receiving spool, a head for locating the broken end of the yarn of the spool, a transfer mechanism to convey the yarn into the proximity of the turbine outlet, a member for cuting the yarn at a certain distance from the broken end, means for positioning this cut end in front of the turbine outlet, means for untwisting the portion of yarn on the spool adjacent to the cut end, and a mechanism longitudinally entraining the yarn and including means for inserting a determined length of yarn into the turbine and means for then withdrawing this yarn once the joint has been made by accelerating the yarn until the yarn attains a speed substantially equal to the required production speed, the improvement wherein said yarn locating head comprises a transmission member for transmitting the movement of said shaft to the disengaged spool, means for displacing the broken end of the yarn from said said spool and means for retaining this yarn, and in that said head is kinematically rigid with said transfer mechanism, which comprises guide means for determining the trajectory of said head between a position in which said transmission member is simultaneously adjacent to the spool and said drive shaft, and a position in which the yarn retained on said head is conveyed at least substantially to the level of the outlet of said turbine, and drive means for moving said head along said trajectory, said positioning means being associated both with guide means for determining a trajectory between a laterally displaced position of the yarn, in which the yarn is held taut between the spool and the vicinity of the turbine outlet, and a position adjacent to this outlet, and with a mechanism for driving them along said trajectory, said positioning means comprising a clamp and a mechanism for

operating the clamp, said cutting member being located between said clamp and said yarn gripping means.

4,150,533

APPARATUS FOR MONITORING YARN TRAVEL AT A MULTIPLE SPINDLE SPINNING MACHINE

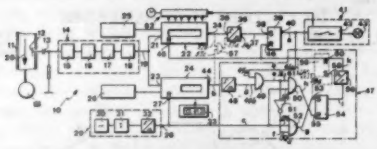
Hermann Gasser, Zürich, and Karl Curiger, Pfäffikon, both of Switzerland, assignors to Luwa AG, Zürich, Switzerland

Filed Jun. 5, 1978, Ser. No. 912,312

Claims priority, application Switzerland, Jun. 9, 1977, 7103/77

Int. Cl.[2] D01H *13/32, 11/00, 13/16*

U.S. Cl. 57—265 **8 Claims**



1. An apparatus for monitoring yarn travel at a multiple spindle spinning machine comprising:

means defining a suction device servicing at least one group of spindles;

said suction device embodying a collecting channel;

a probe arranged within the collecting channel;

an evaluation circuit operatively connected with said probe;

said probe delivering an electrical signal to said evaluation circuit upon passage of fiber flocks past said probe within said collecting channel;

said evaluation circuit being provided with a periodically resettable signal counter having a pre-settable counter value;

said evaluation circuit further being provided with an alarm device;

a cumulative counter having a higher pre-set counter value operatively connected with said alarm device; and

a logic circuit for connecting said cumulative counter with the periodically resettable signal counter in such a manner that said cumulative counter is reset whenever there is absent once or twice a signal from the periodically resettable signal counter.

4,150,534

METHOD AND APPARATUS FOR EXCHANGING SLIVER CANS

Hans Raasch, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 14, 1977, Ser. No. 842,309

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646313

Int. Cl.[2] D01H *9/18*

U.S. Cl. 57—281 **14 Claims**

1. Method of exchanging sliver cans of a spinning machine having individual spinning stations, the sliver cans being disposed in staggered array adjacent and behind one another, by means of a can exchanging device able to travel on a given travel path along the spinning machine which comprises placing the sliver cans in groups of at least three cans on turntables installed below the respective spinning stations of the spinning machine, conducting the can-exchanging device with at least one filled sliver can carried thereby in operating readiness past the groups of at least three cans at the respective spinning stations, stopping at a respective spinning station in response to a signal "sliver missing" from the spinning station and automatically carrying out the following operating steps:

(a) turning the turntable into can-exchanging position if the turntable is not already in such position;

(b) removing from the turntable the sliver can to be exchanged;

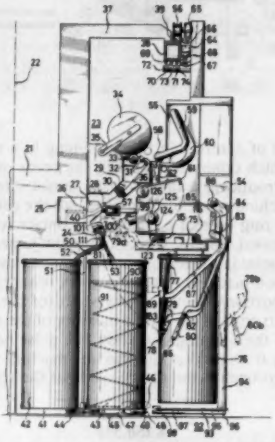
(c) delivering the filled sliver can from the can-exchanging device to the turntable;

(d) turning the turntable back into operating position thereof if necessary;

(e) conducting the can-exchanging device to a loading station and surrendering thereto the removed sliver can; and

(f) providing the can-exchanging device with another filled sliver can to be carried thereby.

5. In combination, a can-exchanging device constrained to travel on a given path along a spinning machine having a plurality of individual spinning stations, comprising turntables disposed below the respective spinning stations for carrying sliver cans in groups of at least three cans for each turntable, means on said can-exchanging device for carrying at least one



filled sliver can in operating readiness past said turntables at the respective spinning stations, means responsive to a signal "sliver missing" from a spinning station for stopping said can-exchanging device at the respective spinning station, and means for automatically performing the following functions:

(a) turning said turntable into can-exchanging position if said turntable is not already in such position;

(b) removing from said turntable the sliver can to be exchanged;

(c) delivering the filled sliver can from the can-exchanging device to said turntable;

(d) turning said turntable back into operating position thereof if necessary;

(e) conducting the can-exchanging device to a loading station and surrendering thereto the removed sliver can; and

(f) providing the can-exchanging device with another filled sliver can to be carried thereby.

4,150,535

ELECTRONIC TIMEPIECE

Shigeru Morokawa, Higashiyamato; Fukuo Sekiya, Tokorozawa, and Yukio Hashimoto, Ishigami-Niiza, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,791

Claims priority, application Japan, Oct. 31, 1974, 49-125801

Int. Cl.[2] G04B *27/08*

U.S. Cl. 58—23 R **29 Claims**

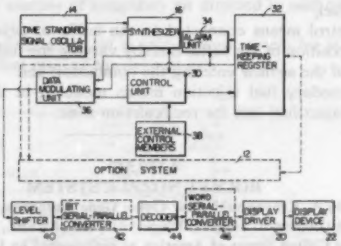
1. An electronic timepiece comprising:

a frequency standard for providing a relatively high frequency signal;

a frequency synthesizer responsive to said relatively high frequency signal to provide a low frequency time unit

signal, timing signals, and a plurality of word pulses indicative of a plurality of data words including time data and additional data;

a timekeeping circuit including shift register means for storing said time data and said additional data therein in response to said timing signals, adder circuit means connected to said shift register means for updating said time data in response to said time unit signal, first gate means for selectively permitting erasure of a selected portion of



each of said time data and said additional data, and second gate means for selectively permitting entry of new data into said shift register means, said shift register means, adder circuit means, first gate means and second gate means being connected in series to constitute a shift register ring through which time data and said additional data are circulated in response to said timing signals; and

display means including a plurality of display elements for displaying said time data and said additional data.

4,150,536

ELECTRONIC TIMEPIECE

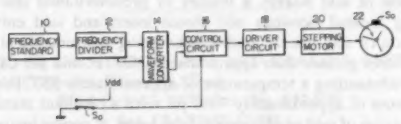
Fumio Nakajima, Tokyo; Kenji Yamada, Koganei; Takayasu Machida, Iruma; Yasushi Nomura, and Minoru Watanabe, both of Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 760,890

Claims priority, application Japan, Jan. 28, 1976, 51-8097; Apr. 2, 1976, 51-36883

Int. Cl.[2] G04C 9/00

U.S. Cl. 58—23 D **8 Claims**



1. An electronic timepiece comprising:

a frequency standard providing a relatively high frequency signal;

a frequency divider providing first and second low frequency signals in response to said relatively high frequency signal;

first and second external control members adapted to be actuated during clockwise and counter-clockwise correction modes, respectively;

means for normally providing alternating current pulses of a first pulse width at a first predetermined frequency in response to said first low frequency signal and operative to provide second and third alternating current pulses of second and third pulse widths in response to said second low frequency signal when said external control members are actuated during said clockwise and counter-clockwise correction modes, respectively; and

a reversible stepping motor operatively connected to time-indicating hands of the timepiece, said reversible stepping motor being rotatable in a clockwise direction in response to said first and second alternating current pulses at first and second speeds, respectively, and also rotatable in a counter-clockwise direction in response to said third alternating current pulses.

4,150,537

ELECTRONIC TIMEPIECE AND METHOD FOR TESTING OPERATION OF THE SAME

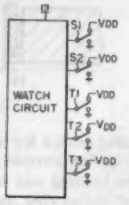
Yoshifumi Mochizuki, and Makoto Yoshida, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Continuation of Ser. No. 664,074, Mar. 5, 1976, abandoned. This application Oct. 18, 1977, Ser. No. 843,249

Claims priority, application Japan, Jun. 3, 1976, 51-29289

Int. Cl.[2] G04B 19/32

U.S. Cl. 58—23 R **6 Claims**



1. In an electronic timepiece having a power source, and a watch circuit chip comprised of an oscillator circuit, a divider circuit connected to the oscillator circuit, a plurality of counter circuits connected in series with the divider circuit to provide time data, and a driver circuit connected to the counter circuits to cause display means to effect a display of said time data, an improvement comprising:

a manually operable correction switch;

a manually operable selection switch;

a plurality of test mode selection terminals externally provided on said circuit chip, said terminals adapted to be selectively supplied with logic signals in a predetermined mode during a test condition to effect selection of one of a plurality of operational characteristics of said timepiece for testing based upon said predetermined mode;

a test mode selection circuit comprised of a plurality of gate means connected to said plurality of test mode selection terminals to generate a plurality of test mode selection signals, indicative of said plurality of operational characteristics in accordance with varying combinations of logical values of said logic signals;

a data selection circuit connected to said selection switch for generating a sequence of data selection signals in response to sequential operation of said selection switch;

control signal generating means comprised of a plurality of gate means having first inputs coupled to said data selection circuit to receive said data selection signals for thereby producing a plurality of control signals in response thereto; and

a plurality of input control circuits each connected to an input of each of said counter circuits and having an input terminal connected to said correction switch to receive an input signal therefrom, said input control circuits being responsive to said control signals to apply said input signal to said counter circuits to update the counts of said counter circuits;

said plurality of gate means of said control signal generating means having second inputs coupled to said test mode selection circuit, selected ones of said plurality of gate means of said control signal generating means being simultaneously responsive to at least one of said test mode selection signals to concurrently generate said control signals, whereby selected ones of said plurality of input control circuits are concurrently rendered operative to

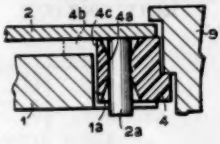
allow testing of combined operational characteristics of selected ones of said plurality of counter circuits.

4,150,538

DIAL ATTACHING DEVICE FOR WATCH

Yasuaki Nakayama, Hanno, and Ryuzo Tanaka, Tanashi, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Nov. 8, 1977, Ser. No. 849,623
Int. Cl.[2] G04B *37/00, 37/04, 19/06*
U.S. Cl. 58—88 R **2 Claims**



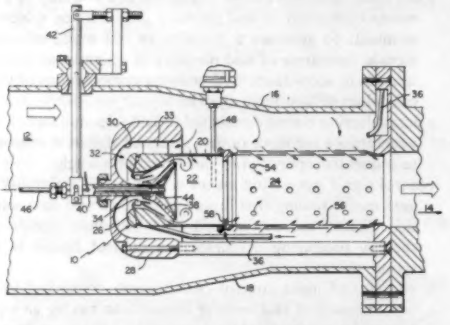
1. A dial attaching device for use in a watch comprising:
(a) a base plate having a recess;
(b) a watch case housing said base plate;
(c) a movement holder ring made of synthetic resin intermediating between said base plate and said watch case, said movement holder ring having a protrusion;
(d) a dial provided with a plurality of feet and mounted through said movement holder ring on said base plate; and
(e) a plurality of through holes formed on said movement holder ring and therethrough said dial feet being inserted to be fixed.

4,150,539

LOW POLLUTION COMBUSTOR

Philip M. Rubins, Manchester, Conn., and John Odgers, Quebec, Canada, assignors to Avco Corporation, Stratford, Conn.

Continuation of Ser. No. 655,353, Feb. 5, 1976, abandoned. This application Jul. 20, 1977, Ser. No. 817,158
Int. Cl.[2] F02C *7/22*
U.S. Cl. 60—39.23 **1 Claim**



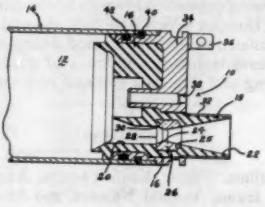
1. A low pollution combustor adapted to receive airflow from the compressor stage of a gas turbine engine and to discharge heated airflow therefrom to the turbine stage of the engine comprising:
a cylindrical combustor housing having forward and rear portions;
an aerodynamically contoured inlet mounted on the forward portion of the combustor housing and adapted to direct airflow into the housing; said inlet having a diverging cross section;
a support structure fixed at the entrance of the inlet;
a baffle mounted on the support structure for axial sliding movement thereon, said baffle extending into the inlet and being contoured to form in cooperation with the inlet a gradually restricted channel for the airflow as it flows through the inlet, said airflow being accelerated thereby to create a zone of recirculating airflow in the forward portion of the combustor housing;
fuel injecting means mounted in the inlet channel to premix fuel with the airflow prior to said airflow entering the forward portion of the combustor housing;
a plurality of swirl vanes mounted in the inlet upstream of the fuel injecting means to enhance the mixing of air and fuel;
control means connected to the baffle to adjust the axial position of the baffle thereby varying the fuel to air ratio of the airflow entering the combustor; and
secondary fuel injection means mounted in the baffle to inject fuel into the recirculation zone.

4,150,540

ROCKET NOZZLE SYSTEM

Harold A. Krayenbuhl, Fair Oaks; Gene Dolgonas, Carmichael, and Charles J. Rogers, Placerville, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,676
Int. Cl.[2] F02K *9/04*
U.S. Cl. 60—271 **2 Claims**



1. A rocket nozzle system comprising a supporting structure, said supporting structure having at least one nozzle formed as an integral part thereof, said nozzle having an entrance section and an exit section, a throat located intermediate said entrance and exit sections of said nozzle, a throat insert formed of a pyrolized graphite cloth laminate secured within said throat section of said nozzle, a washer of predetermined thickness being located between said throat insert and said entrance section of said nozzle, said washer being consumable at temperatures greater than approximately 700° F. and yet capable of withstanding a temperature of approximately 320° F. and a pressure of approximately 7000 psi with a resultant maximum reduction of said predetermined thickness of approximately 15 percent and a steel housing encompassing said supporting structure, said supporting structure being transfer molded as one piece into said steel housing.

4,150,541

EXHAUST GAS CLEANING APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Yoshio Yamakawa, Toyota, and Yoshiki Fukumori, Obu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Sep. 22, 1977, Ser. No. 835,691
Claims priority, application Japan, Jul. 1, 1977, 52-77817
Int. Cl.[2] F01N *3/15*
U.S. Cl. 60—276 **3 Claims**

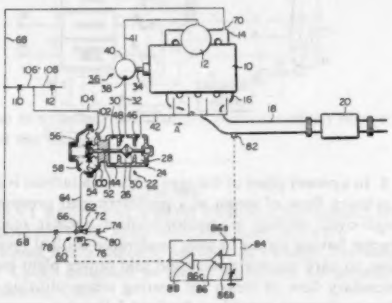
1. An exhaust gas cleaning apparatus of an internal combustion engine having an intake system, an engine body and an exhaust system, said apparatus comprising:
a three-way catalytic converter disposed in said exhaust system, said converter being operable for cleaning three major toxic components in the exhaust gas when an air-

fuel ratio of the exhaust gas is maintained near a predetermined value;

a pipe means for introducing secondary air into said exhaust system located upstream of said three-way catalytic converter;

a vacuum-operated flow control valve device located on said pipe means, said valve device having a spring-urged diaphragm for forming a main vacuum signal chamber on one side of said diaphragm for moving said diaphragm, in accordance with a vacuum force applied thereto, to control the amount of secondary air directed to said exhaust system;

a sensor means arranged in said exhaust system for sensing the air-fuel ratio of the exhaust gas;



vacuum transmitting means responsive to electric signals from the sensor means for selectively transmitting a vacuum signal from a vacuum port formed in the intake system into said main vacuum chamber of the vacuum-operated flow control valve for controlling the vacuum level in the main vacuum chamber of the flow control valve; and

vacuum introducing means for transmitting a vacuum signal from said vacuum port into a second vacuum chamber formed on the other side of said diaphragm opposite to said main chamber, so that vacuum pressure is formed in said second chamber for maintaining a substantially constant rate of movement of the diaphragm during all engine running conditions.

4,150,542

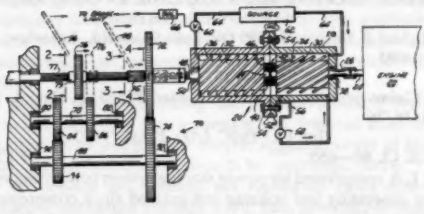
FLUID TRANSMISSION UNIT AND BRAKING SYSTEM

Marvin C. Spears, Knoxville, Tenn.

Filed Oct. 17, 1977, Ser. No. 842,570

Int. Cl.² F16D *33/00*

U.S. Cl. 60—330 **11 Claims**



1. A fluid drive transmission for a vehicle, comprising: a fluid filled housing; a drive roller and a driven roller endwise spaced one from the other and rotatably mounted inside said housing, each of said rollers having a spiral type vane mounted about its longitudinal periphery; said drive roller having a greater spacing intermediate its periphery and the inside surface of said housing than said driven roller.

4,150,543

AUTOMATIC CHANGE-SPEED TRANSMISSION WITH A SECONDARY SERVO-GENERATOR FOR THE EMERGENCY SUPPLY OF AGGREGATES OF THE TRANSMISSION CONTROL AND SHIFTING SYSTEM OPERATING WITH A SERVO-FORCE

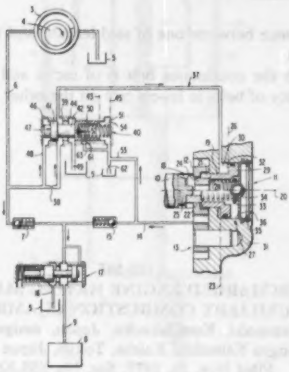
Josef Helmer, Aich, and Hermann Gaus, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,538

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642804

Int. Cl.² F15B *20/00, 13/09*

U.S. Cl. 60—403 **16 Claims**



1. An automatic change-speed transmission for vehicles, comprising first drive connection means between a transmission output shaft adapted to be coupled with vehicle wheels and a secondary servo-force generator means for the emergency supply of aggregates of transmission control and shifting means operating with a servo-force, disengaging means operable to disconnect said first drive connection means, second drive connection means between a transmission input shaft operable to be driven by a driving engine and a primary servo-force generator means for the normal supply of the aggregates, and servo-motor means actuating the disengaging means and operable to be displaced into a disengaging position in dependence on an operating magnitude of the primary servo-force generator means, in which the secondary servo-force generator means is effectively disconnected from the transmission output shaft but being in an operating position operable to establish the first drive connection means between the secondary servo-force generator means and the transmission output shaft when the rotational speed of the transmission input shaft approaches zero, characterized in that the servo-motor means is held in its working position by a holding control means which includes a control valve slide means operating in dependence on the servo-force of the primary servo-force generator means when the actual value of said servo-force lies below a necessary operating value.

4,150,544

ENGINE

John J. Pachter, 36 Faye Ave., Shelby, Ohio 44875

Filed Oct. 14, 1976, Ser. No. 732,471

Int. Cl.² F03G *7/06*

U.S. Cl. 60—527 **2 Claims**

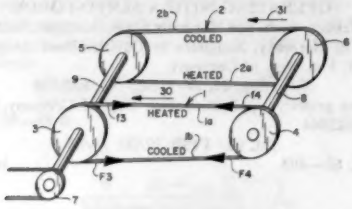
1. A heat engine comprising:

two spaced pulleys;

a continuous belt which is mounted on said pulleys in a closed loop to provide two parallel lengths of belt each extending between the two pulleys and each extending tangentially from each of the two pulleys;

means for prestressing the belt; and

means for changing the length of one of the lengths of belt relative to the other length by creating a temperature



difference between one of said lengths and the other said length

in which the continuous belt is of metal and consists of a plurality of belts in layers one on the other.

4,150,545

SUPERCHARGED ENGINE HAVING MAIN AND AUXILIARY COMBUSTION CHAMBERS

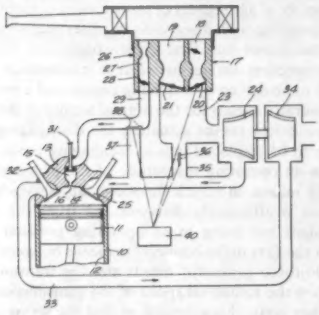
Shuichi Yamazaki, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,321

Claims priority, application Japan, Dec. 10, 1976, 51-147825

Int. Cl.[2] F02B *33/44, 75/02*

U.S. Cl. 60—611 **6 Claims**



1. In an internal combustion piston engine having a main combustion chamber and an auxiliary combustion chamber connected by a torch opening, a first carburetor communicating with a main intake passage, a second carburetor communicating with an auxiliary intake passage, means connecting said main intake passage to said main combustion chamber, said means including a rotary supercharger, said means also including a first bypass passage around said supercharger, a second bypass passage connecting said main intake passage and said auxiliary intake passage, and means responsive to the power output of the engine and acting, when the output is low, to open the first bypass passage and to close the second bypass passage, said means acting, when the engine output is high, to close the first bypass passage and open the second bypass passage, whereby all of the mixture from the first carburetor must pass through the supercharger and whereby a part of that mixture is delivered to both of said combustion chambers.

4,150,546

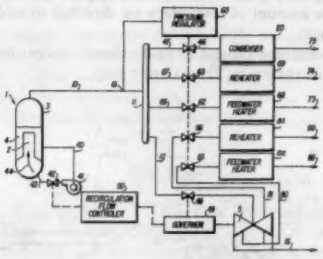
METHOD AND APPARATUS FOR LOAD FOLLOWING WITH A SINGLE-CYCLE BOILING MODERATOR-COOLANT NUCLEAR REACTOR

Wells I. Collett, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Dec. 3, 1976, Ser. No. 747,133

Int. Cl.[2] G21D *3/08*

U.S. Cl. 60—644 **22 Claims**



1. In a power plant of the type wherein a turbine is driven by a primary flow of steam at a predetermined pressure from a single-cycle boiling moderator-coolant nuclear reactor, said reactor having means to vary moderator-coolant recirculation flow, to vary reactor power and said power plant including a secondary flow of steam for heating steam utilizing auxiliary plant equipment, a method for load following comprising the steps of:

adjusting said primary flow of steam from said reactor to said turbine for changing demands for turbine power;

adjusting said moderator-coolant recirculation flow through the reactor in response to changing demands for turbine power;

monitoring the pressure of said primary flow of steam;

reducing said secondary flow of steam to said steam utilizing auxiliary plant equipment, in the case of a rapid increase in turbine demand that causes a decrease in the pressure of the primary flow of steam, thereby maintaining said pressure and preventing a decrease in turbine power; and

restoring said secondary flow of steam to said auxiliary plant equipment after adjustment of said moderator-coolant recirculation flow has increased reactor power and increased the pressure of said primary flow of steam.

4,150,547

REGENERATIVE HEAT STORAGE IN COMPRESSED AIR POWER SYSTEM

Michael J. Hobson, S 5890 Old Lake Shore Rd., Lakeview, N.Y. 14085

Filed Sep. 14, 1977, Ser. No. 833,186

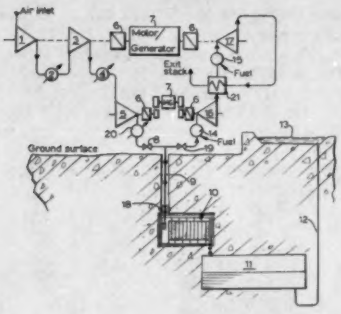
Claims priority, application United Kingdom, Oct. 4, 1976, 41116/76

Int. Cl.[2] F02C *1/00;* **F28D** *17/00*

U.S. Cl. 60—659 **5 Claims**

1. A compressed air power storage system comprising means for generating and utilizing compressed air, a compressed air storage cavern, a heat storage cavern containing a heat storage medium, a first air passage extending between the compressed air generating and utilizing means and the heat storage cavern, a second air passage extending between the heat storage cavern and the air storage cavern, and a housing for the heat storage medium within the heat storage cavern, said housing being spaced from the walls and roof of the cavern and having an external water barrier, a heat insulating lining within the

barrier, and internal structure defining a serpentine path through the heat storage medium for passing air between the



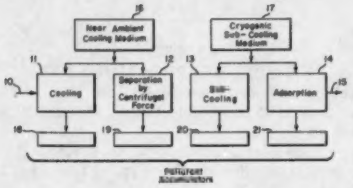
passages so as to ensure substantially uniform contact between the air and the medium.

4,150,548

POLLUTANT REMOVAL FROM PYROLYTIC GASES BY CENTRIFUGE AND MOLECULAR SIEVES

Klaus M. Kemp, Santa Barbara, and Jack E. Lehman, Torrance, both of Calif., assignors to Kemp Reduction Corporation, Santa Barbara, Calif.

Filed Oct. 26, 1976, Ser. No. 735,598
Int. Cl.[2] F25J *3/08*
U.S. Cl. 62—18 **5 Claims**



1. A method of treating and removing pollutants from gaseous products produced by pyrolytic conversion of materials, including the sequential steps of:

(a) guiding and imparting a given flow velocity to said gaseous products in a confined insulated environment;

(b) cooling the flowing gaseous products to a temperature below the dew point of condensable vapors to remove a substantial portion of water in the gaseous products;

(c) guiding the remaining gaseous products in an upward direction through a polymeric mesh material in a refrigerated emvironment to remove benzene homologs, any additional water, petrochemical pollutant droplets and the like;

(d) guiding and accelerating the gaseous products along curved paths to effect separation and removal from the system of particulate and droplet agglomerations of pollutants and hydrocarbon liquids by centrifugal force;

(e) sub-cooling and guiding the remaining gases downwardly and thence through a 180° turn upwardly to separate and remove heavy agglomerates and to pass such gases through an acid resistant zeolite molecular type sieve bed for adsorption of residuals of chlorine gas, sulfur dioxide, hydrogen chloride and oxides of nitrogen to provide a dry gaseous product stream; and,

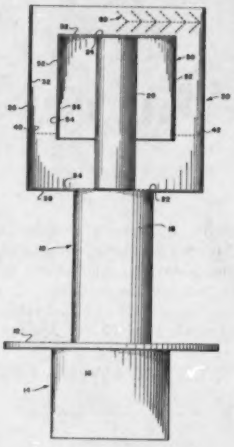
(f) further cooling and passing said gaseous product stream through lower and upper stage molecular sieve beds respectively to separate by adsorption any last remnants of carbon monoxide and remove them from the system, and to thereby provide clean fuel gases.

4,150,549

CRYOPUMPING METHOD AND APPARATUS

Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 16, 1977, Ser. No. 797,282
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—55.5 **5 Claims**



1. A cryopumping apparatus comprising in combination:

a base to fix said apparatus to a vacuum chamber;

a first refrigeration source supported by said base and constructed to provide a temperature source at less than 120° K. inside said vacuum chamber;

a second refrigeration source supported by said base and constructed to provide a temperature source at less than 25° K. inside said vacuum chamber;

a first panel adapted to be supported by said base in said vacuum chamber to be cooled by said first refrigeration source and having the shape of a cylinder with a closed bottom and open top, said panel having a polished outer and inner surface, the inner bottom surface of said first panel being coated with a radiant absorbing coating; and

a second panel in the form of a closed bottom open-top cylinder of smaller diameter and shorter length than said first panel supported in an inverted position inside said first panel without contacting said first panel, said second panel cooled by said second refrigeration source, and having a polished outer surface and a gas absorbing material on said inner surface, said second panel being of a size and shape to permit portions of a vacuum environment to circulate between said first and second cryopanels and contact said gas absorbing material.

4,150,550

SELF DEFROSTING REFRIGERATED DISPLAY CASE

John F. Mercer, Sr., Globe, Ariz., assignor to George W. Leech, Globe, Ariz.

Filed Nov. 3, 1977, Ser. No. 848,112
Int. Cl.[2] A47F *3/04*
U.S. Cl. 62—252 **7 Claims**

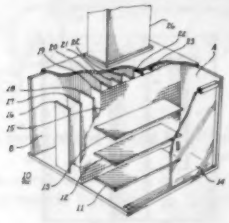
1. A refrigerated display case for maintaining a frost free product environment, said display case comprising in combination:

a. a source of dry cold air;

b. a first compartment for receiving and mixing the dry cold air under pressure;

c. a second compartment for storing refrigerated products, said second compartment including door means for providing access to the products;

d. a screen disposed intermediate said first compartment and said second compartment for diffusingly conveying the dry cold air from said first compartment to said second compartment in response to the pressure differential attendant said first and second compartments;



e. a port disposed in the upper part of said second compartment for exhausting the higher temperature air within said second compartment and maintaining said second compartment at a pressure lower than said first compartment;

whereby, said second compartment and the products are immersed in a continuous flow of dry cold air to absorb any moisture and the moisture entrained air is exhausted through said port to preclude the formation and continuing existence of frost.

4,150,551

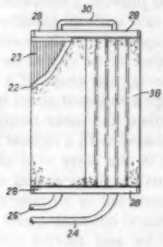
COOLING APPARATUS

Paul Eisler, 57 Exeter Rd., London NW2, England

Continuation-in-part of Ser. No. 541,258, Jan. 15, 1975, abandoned. This application Dec. 20, 1977, Ser. No. 862,549

Int. Cl.[2] F28D *21/14*

U.S. Cl. 62—281 **16 Claims**



1. Cooling panel structure for presenting a drip-free heat absorption surface toward an area to be cooled, comprising in combination, a composite panel of two substantially parallel surfaces, the first being a primary heat absorption surface of a sheet structure impervious to air and water having one face area to be directed as a cooling surface, and the second being a secondary heat absorption surface covering for interposition between said cooling surface and the area to be cooled being at least partly in adhering engagement with said cooling sheet at selected positions on said face area and consisting of a hydrophilic cellulosic fibrous material providing capillarity flow parallel to the surface of the cooling sheet, said secondary surface disposed adjacent to and masking substantially the entire surface of said face area thereby to accumulate and absorb water condensation so that the fibrous material prevents droplets from forming and dripping away from said face area formed by said cooling sheet surface with the fibrous material interposed between it and the area to be cooled.

4,150,552

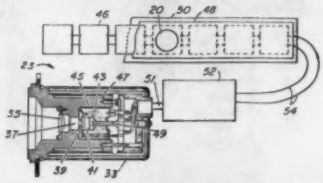
INFRARED COOLER FOR RESTRICTED REGIONS

Gerald Altman, 41 Westminster Rd., Newton Centre, Mass. 02159

Continuation-in-part of Ser. No. 707,852, Jul. 22, 1976, which is a continuation-in-part of Ser. No. 445,052, Feb. 25, 1974, Pat. No. 3,994,277, which is a continuation-in-part of Ser. No. 422,426, Dec. 6, 1973, abandoned. This application Nov. 26, 1976, Ser. No. 745,111

Int. Cl.[2] F25B *21/02*; F24J *3/02*

U.S. Cl. 62—467 R **9 Claims**



1. A radiation cooler comprising infrared radiation sink means of restricted geometrical dimension and infrared radiation condensing means of extended geometrical dimension along an optical axis, said radiation sink means comprising a substantially black body surface, said condensing means communicating optically with a selected geometrical region, heat exchanger means for removing heat from said radiation sink means, temperature sensing means communicating with said selected geometrical region, said temperature sensing means being a pyrometer, and control means operatively connected between said temperature sensing means and said heat exchanger means.

4,150,553

WHEEL BEARING MOUNT

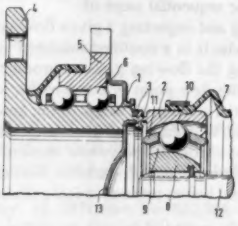
Erich Aucktor, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 21, 1976, Ser. No. 688,832

Claims priority, application Fed. Rep. of Germany, May 23, 1975, 2522841

Int. Cl.[2] B62D *7/06*

U.S. Cl. 64—22 **3 Claims**



1. A bearing mount for a wheel driven through a constant velocity universal joint comprising an outer bearing ring having a parallel pair of first annular tracks and connected to a wheel support, an inner bearing ring having a parallel pair of second annular tracks opposed from said first tracks and connected to a wheel hub, pluralities of ball bearings in said opposed tracks to define a double row anti-friction bearing, and a constant velocity universal joint having an outer joint member axially adjacent said inner bearing ring and attached thereto by a weld, said inner bearing ring and said outer joint member each having flanges and abutting annular projections on said flanges, said abutting annular projections attached by said weld, said outer joint member being independent of said bear-

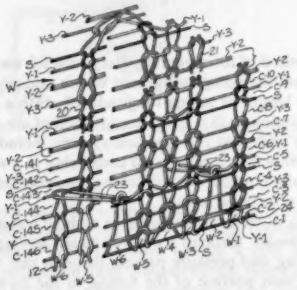
ing such that the wheel bearing mount and the universal joint are separate units.

4,150,554

PANTY HOSE WITH ELASTIC WAIST BAND

Edward L. Cassidy, Sr., Burlington, N.C., assignor to Alamance Industries, Inc., Burlington, N.C.

Filed Aug. 22, 1977, Ser. No. 826,375
Int. Cl.[2] D04B 9/42, 9/54
U.S. Cl. 66—172 E 8 Claims



1. In a lower body garment including a single-ply panty portion knit of successive courses containing a predetermined number of wales and provided with an upper waist opening, the combination therewith of an outwardly turned two-ply waist band integrally knit with the single-ply panty portion, said two-ply waist band simulating the appearance of an elastic tape and aiding in maintaining the waist opening in position on the wearer, said waist band comprising

(a) an inner ply including a lower end integrally knit with the upper end of said single-ply panty portion and containing a lesser number of wales than said single-ply panty portion,

(b) an outer ply including an upper end integrally knit with the upper end of said inner ply and containing the same number of wales as said inner ply,

(c) a spandex yarn incorporated in spaced apart courses of said outer ply,

(d) first textured body yarn of a selected denier knit in courses immediately adjacent each side of said spaced apart courses in which said spandex yarn is incorporated of said outer ply,

(e) second textured body yarn of substantially two times the denier of said first textured body yarn and knit in courses joining said courses of said first textured body yarn of said outer ply, said spandex yarn and said first and second body yarns forming coursewise extending ribs on the outer surface of said outer ply to simulate the appearance of an elastic tape,

(f) a tab comprising a few courses and including an upper end integrally knit with the lower end of said outer ply and extending downwardly therebelow,

(g) spaced apart connecting stitch loops joining selected wales in the upper end of said single-ply panty portion to corresponding wales in the upper end of said tab so that said tab covers said connecting stitch loops, and

(h) a make-up selvage edge on the lower end of said tab.

4,150,555

BLIND RIVETING UNIT

Jozef Fulier, Nove Mesto nad Vahom, Czechoslovakia, assignor to Vyskumny ustav mechanizacie a automatizacie, Nove Mesto nad Vahom, Czechoslovakia

Filed Nov. 18, 1977, Ser. No. 852,927
Claims priority, application Czechoslovakia, Nov. 18, 1976, 7418.76
Int. Cl.[2] B21J 15/34
U.S. Cl. 72—114 7 Claims

1. In a blind riveting unit which in one operation anchors a hollow blind rivet blank to one pull stud and heads another rivet blank which has been previously anchored to another pull stud, said unit having a body, a member having aligned oppositely extending first and second arms, the first arm bearing a first pull stud and a first abutment cooperating therewith, the second arm bearing a second pull stud and a second abutment cooperating therewith, the studs being reciprocable relative to the respective abutments, means pivotally mounting the member on the body for rotation between first and second positions which are displaced from each other by an angle of 180°, means including a rivet deforming head mounted on the body to deform and anchor a hollow rivet blank to a pull stud, driving means to move the rivet blank deforming means axially toward a first stud aligned with the head to anchor the rivet blank thereon, and means driven by said driving means in the same direction axially of the arms as the rivet blank deforming head to cause the other pull stud and its abutment to approach each other thereby to head another rivet blank anchored on the second pull stud, the rivet blank deforming head being disposed at the first angular position, and the heading of the anchored rivet blank on the second stud taking place at the second angular position, the improvement which comprises means for controlling said driving means, and means responsive to the turning of the member with respect to the body for preventing movement of the driving means unless the member is turned with respect to the body so that one of the studs is aligned with the rivet deforming head.

4,150,556

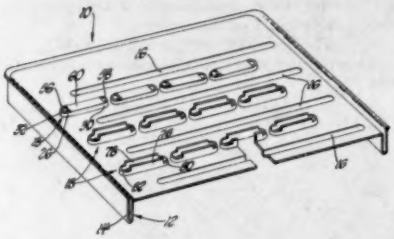
RADIATOR TANK HEADSHEET AND METHOD

William Melnyk, Lathrup Village, Mich., assignor to McCord Corporation, Detroit, Mich.

Filed Feb. 27, 1978, Ser. No. 881,765
Int. Cl.[2] B21D 28/00
U.S. Cl. 72—333 2 Claims

1. A method of forming an integral ferrule around an elongated opening in a sheet of material comprising the steps of forming an elongated depression in the sheet material having generally parallel sidewalls, endwalls joining the sidewalls, and a bottomwall, forming a pair of holes in the depression by removing a slug of sheet material from the bottomwall adjacent each of the endwalls, splitting the bottomwall generally along its centerline between the holes to form two bottomwall

segments, and forcing the two segments outwardly and into coplanar relationship with the sidewalls of the depression to



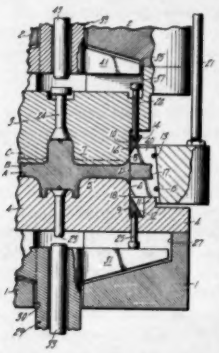
form an elongated opening including an integral ferrule having generally parallel, relatively high sidewalls and endwalls of lesser height joining the sidewalls.

4,150,557

FORGING APPARATUS HAVING MEANS FOR RADIALLY MOVING BLADE DIE SEGMENTS

Bryant H. Walker, Stuart, and Ralph B. Bogard, North Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1977, Ser. No. 860,517
Int. Cl.[2] B21K *1/32*
U.S. Cl. 72—354 **7 Claims**



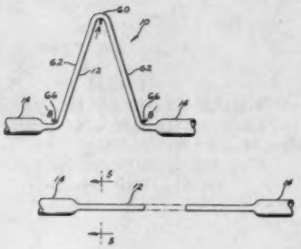
1. A forging apparatus having an upper die and a lower die, said upper die having a first finished disc shape on its outer end, said lower die having a second finished disc shape on its outer end, said outer ends of said upper and lower dies being spaced from each other, a cylindrical array of blade dies being positioned around the space between the outer end of said upper die and the outer end of said lower die, said cylindrical array of blade dies having an inner surface contacting said upper die and said lower die, said cylindrical array of blade dies having an outer surface, a back-up ring movable between a position spaced from said cylindrical array of blade dies to a position against said outer surface of said cylindrical array of blade dies, a first cam means located around said upper die, second cam means located around said lower die, said cylindrical array of blade dies having third cam means, said first and second cam means on said upper die and lower die being movable to engage said third cam means and move said blade dies outwardly when said back-up ring is spaced from said outer surface of said cylindrical array of blade dies.

4,150,558

METHOD FOR FORMING A VARIABLE RESTRICTOR

Walter J. Pohl, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1977, Ser. No. 848,538
Int. Cl.[2] B21D *51/16, 53/06*
U.S. Cl. 72—367 **2 Claims**



1. The method of forming a capillary tube for use in a refrigeration system including refrigerant which comprises:

forming a length of tubing longitudinally into a preselected configuration so that the free ends thereof are arranged to connect with said refrigeration system, including at least one portion intermediate said ends being in a single plane;

placing said portion of said tubing intermediate said free ends in a forming means;

connecting at least one of said free ends to a source of constant pressure through a control means having means for measuring said pressure passing through said tubing;

squeezing said portion of the tubing in the forming means until the tubing reaches an intermediate predetermined restriction; then

bending said portion to provide a generally U-shaped restriction having leg members diverging from an arcuate apex segment and having arcuate segments at the juncture of each of said leg members with said tubing;

connecting said tubing including said portion in refrigerant flow arrangement in said refrigeration system and operating said system;

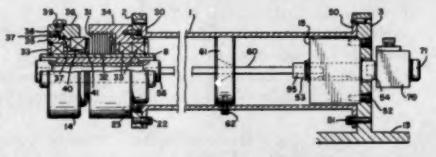
moving at least one of said leg members relative to the other to change the diameter of at least one of said arcuate portions while said refrigerant system is operating to fine tune the refrigerant flow through said capillary until the restriction causes refrigerant passing through said tubing to reach a final predetermined pressure.

4,150,559

VARIABLE RATE TEST JOINT

Lloyd E. Levy, Princeton, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 20, 1978, Ser. No. 890,607
Int. Cl.[2] G01L *3/18, 25/00*
U.S. Cl. 73—1 C **8 Claims**



1. Variable rate test joint comprising:

a support;

a brake attached to said support;

a one-way clutch attached to said support and spaced apart from said brake;

a torsion spring engaged with and mounted between said

brake and said one-way clutch for rotation with said clutch and said brake;

a means for actuating said brake; and

a means for measuring torque applied to said torsion spring at its one-way clutch engaging end.

4,150,560

MEASURING CELL FOR THE CONTINUOUS DETERMINATION OF A LIQUID, ESPECIALLY A BEVERAGE FLOWING THROUGH A PIPE

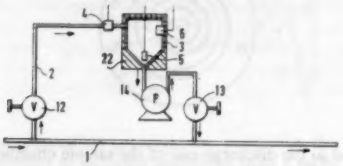
Dieter Wieland, Oststrasse 1, 4000 Düsseldorf, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,999

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634971

Int. Cl.[2] G01N 7/14

U.S. Cl. 73—19 **8 Claims**



1. A measuring cell for the continuous determination of the carbon dioxide content of a flowing liquid, especially a beverage, comprising inner chamber having a first substantially cylindrical portion, an input conduit for the feeding of liquid to the cell and having a portion entering at one end of the first portion tangentially to its peripheral surface, a discharge line for the removal of the liquid having a portion disposed in the direction of the longitudinal axis of the first portion and entering the chamber below said one end, wherein the input conduit having means for constricting same at or immediately upstream of the point of entry comprising an orifice, means for clearing the orifice of the constricting means comprising a spray nozzle disposed immediately upstream of the orifice and having the output thereof aligned with the orifice in the direction of flow, a conduit connected to the spray nozzle and receptive of liquid under high pressure and a valve in said conduit for selectively effecting the blowing of high-pressure liquid from said spray nozzle into the orifice to clear same, first means disposed within the said chamber in the immediate vicinity of the point of entry or directly upstream of the entry of the said discharge line for measuring of the temperature of the liquid, second means disposed at the inner wall of the first portion for measuring the outgassing pressure of the liquid, wherein said first and second means produce electrical signals corresponding to the measured values and conductors for carrying the signals out of the chamber of the measuring cell.

4,150,561

EMPLOYING A FLUIDIC OSCILLATOR, FOR DETERMINING THE CONSTITUENT GASES OF A GAS MIXTURE

Joseph E. Zupanick, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed May 1, 1978, Ser. No. 901,535

Int. Cl.[2] G01N 29/02

U.S. Cl. 73—23 **3 Claims**

1. A method of determining the constituent gas proportions of a gas mixture comprising the steps of:

(A) measuring the pulse repetition frequency of an astable fluidic oscillator while the gas mixture flows through the oscillator;

(B) under the same pressure and temperature conditions employed in step (A), measuring the pulse repetition frequency of the astable fluidic oscillator while a standard example of a constituent gas flows through the oscillator;

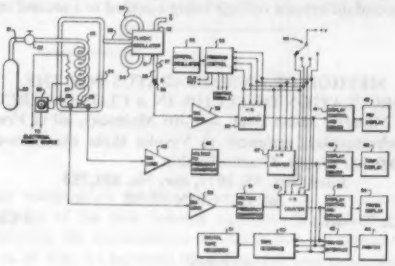
(C) repeating step (B) for each constituent gas for which the proportion of such gas in the gas mixture is to be determined;

(D) repeating steps (A), (B), and (C), at a different temperature;

(E) repeating step (D) until the total number of different temperatures at which pulse repetition frequency measurements are taken at least equals the total number of constituent gases for which the proportion of each in the gas mixture is to be determined;

(F) solve, for $C_1 \ldots C_n$, the following simultaneous equations:

$$1/(prf)x_{T_O} = C_1/(prf)1_{T_O} = C_2/(prf)2_{T_O} = C_3/(prf)3_{T_O} + \ldots + C_n/(prf)n_{T_O}$$



$$1/(prf)x_{T_1} = C_1/(prf)1_{T_1} = C_2/(prf)2_{T_1} = C_3/(prf)3_{T_1} + \ldots + C_n/(prf)n_{T_1}$$

$$1/(prf)x_{T_n} = C_1/(prf)1_{T_n} = C_2/(prf)2_{T_n} = C_3/(prf)3_{T_n} + \ldots + C_n/(prf)n_{T_n}$$

where:

(prf)x_{T_O} = the pulse repetition frequency at temperature T_O using the gas mixture as the working fluid;

$(prf)1_{T_O}$, $(prf)2_{T_O}$, $(prf)3_{T_O}$, $(prf)n_{T_O}$ = the pulse repetition frequency

at temperature T_O successively using each constituent gas as the working fluid;

T_O, T_1, T_n = signify different temperatures

C_1, C_2, C_3, C_n = the respective proportions of the individual constituent gases to the whole of the gas mixture.

4,150,562

METHOD AND MEANS FOR TEMPERATURE COMPENSATION IN EXHAUST GAS SENSORS

Arnold D. Nielsen, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 31, 1978, Ser. No. 911,257

Int. Cl.[2] G01N 27/46

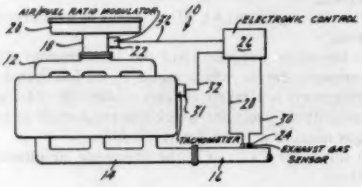
U.S. Cl. 73—27 R **15 Claims**

7. A system for temperature compensating the resistance variation of an engine exhaust gas sensor responsive to a partial pressure of oxygen indicative of the air/fuel ratio of engine operation comprising:

an interface means for establishing a first difference voltage which is a function of a reference voltage and a function of a sensor voltage which is related to the resistance of said exhaust gas sensor;

a compensation means for establishing a second difference voltage which is a function of a tachometer voltage related to engine speed and a function of a bias voltage which serves to adjust the magnitude of said second difference voltage; and

a first comparator means for establishing a third difference voltage which is a function of said first and second difference voltages and adapted to provide a first output for use



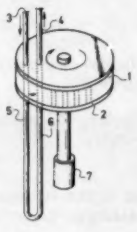
in controlling the air/fuel ratio of engine operation, said first difference voltage being coupled to a first input and a second difference voltage being coupled to a second input.

4,150,563

METHOD OF AND APPARATUS FOR THE RECIRCULATION OF FLUIDS IN A CLOSED CIRCUIT

Milan Minarik; Milan Popl, and Jiri Mostecky, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Praque, Czechoslovakia

Filed Nov. 15, 1977, Ser. No. 851,783
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—61.1 C **5 Claims**



1. In a method of liquid recirculation in an at least substantially closed circuit having a circuit inlet and a circuit outlet by moving the circulating liquid into the inlet of the circuit by working fluid supplied under pressure to the circuit, the improvement which comprises mechanically and at regular intervals repeatedly transporting circulating liquid approaching the end of the circuit beyond the circuit outlet in the form of slugs of equal volume into the beginning of the circuit in advance of the circuit inlet, and again pushing these slugs into the circuit inlet by means of working fluid, the injection of one slug into the circuit inlet and the pushing of the following slug out of the circuit outlet being carried out simultaneously.

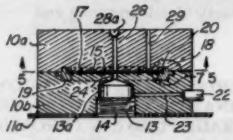
4,150,564

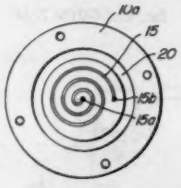
OSMOMETER FOR COLLOID OSMOMETRY

Wayne K. Barlow, and Howard G. Schimmelpfennig, both of Logan, Utah, assignors to Wescor, Inc., Logan, Utah

Filed Apr. 10, 1978, Ser. No. 895,111
Int. Cl.[2] G01N *13/04*
U.S. Cl. 73—64.3 **6 Claims**

1. In a colloid osmometer having a sensing head provided with substantially coextensive sample and reference chambers separated by an osmotic membrane, the improvement comprising sample and reference chambers of corresponding, elongate, narrow, sinuous formation free of abrupt bends and having means for the supply of sample and reference solutions, respectively, at one set of ends, and means for the discharge of sample and reference solutions, respectively, at an opposite set of ends; and a waste collection system for liquid flushed from the sample chamber, said system comprising a waste receptacle adapted to constantly maintain a pool of waste liquid at constant depth, and a drain tube adapted to have one of its ends





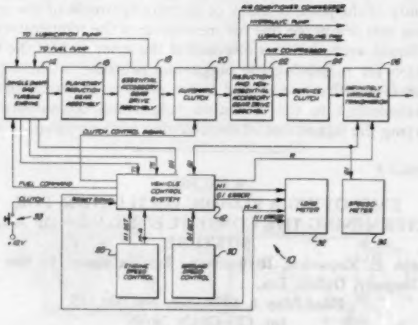
connected to the discharge end of the sample chamber and to have its other end submerged in said pool of waste solution.

4,150,565

VEHICULAR SINGLE SHAFT GAS TURBINE ENGINE POWER SYSTEM

Bernard B. Poore, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 623,319, Oct. 17, 1975, Pat. No. 4,109,772.
This application Nov. 10, 1977, Ser. No. 850,309
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—133 R **10 Claims**



8. A load meter for a vehicle powered by a gas turbine engine comprising an indicator connected to indicate engine operating speed when the engine is operating at less than full engine power and indicating means connected to indicate a difference between commanded vehicle performance and actual vehicle performance when the engine is operating at full engine power.

4,150,566

TORQUE MEASURING DEVICE FOR GAS TURBINE ENGINES, ESPECIALLY TURBO JET ENGINES

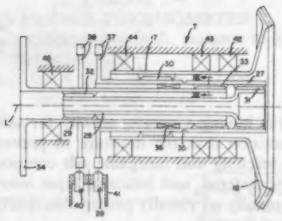
Wolf Loebel, Germering, and Robert Rütsch, Karlsfeld, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,694

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654863

Int. Cl.[2] G01L *3/10*

U.S. Cl. 73—136 A 13 Claims



1. Torque measuring apparatus for measuring the torque being transmitted to auxiliary assemblies from a turbo jet engine or the like; said apparatus comprising:

a first rotatable shaft drivingly engageable with an engine,

a second rotatable shaft in driving engagement with at least one auxiliary assembly,

a third rotatable shaft interposed between said first and second shafts for transmitting torque between said first and second shafts, said third rotatable shaft being elastically deformable in response to the magnitude of torque being transmitted between said first and second shafts with a resultant relative rotation of said first and second shafts,

and detecting means for detecting the relative rotation of said first and second shafts,

wherein said third shaft is in continuous driving engagement with said first shaft by means of a first toothed arrangement at said third and first shafts, wherein said third shaft is in continuous driving engagement with said second shaft by means of a second toothed arrangement at said third and second shafts, wherein said first and second toothed arrangements are spaced axially from one another on said third shaft,

wherein said first, second, and third shafts are coaxial with one another, and further comprising a third toothed arrangement for drivingly connecting said first and second shafts in bypassing relationship to said third shaft, said third toothed arrangement including respective teeth at said first and second shafts that are spaced circumferentially from one another out of driving contact when the torque being transmitted is below a predetermined value, the consequent relative rotation of said first and second shafts during transmission of torques above said predetermined value causing driving connection of said third toothed arrangement.

4,150,567

METHOD OF ESTIMATING ENERGY LOSS FROM PNEUMATIC TIRES

Dusan C. Prevorsek; Young D. Kwon, and Raj K. Sharma, all of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 29, 1978, Ser. No. 920,591

Int. Cl.[2] G01M *17/02*

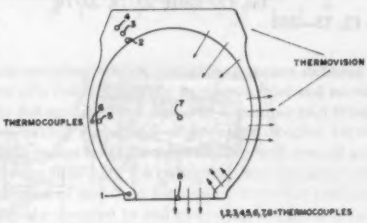
U.S. Cl. 73—146 1 Claim

1. Process of estimating the energy loss from a tire during operation, without wheel testing of that tire, comprising:

(a) wheel testing two reference tires, having different construction parameters and measuring the temperatures at a few points within the tire body;

(b) measuring with a high strain dynamic viscoelastometer the heat generation rate and dynamic tensile moduli (at various temperatures, strain frequencies and tensions) of the cords and rubber used in each tire, thus determining the values of the exponents "X" in the general equation relating cyclic strain amplitude, S, in the tire cord and in the rubber of each tire vs. the dynamic tensile moduli, E, for cords and rubber at given temperature, in the form: $S_A/S_B=(E_A/E_B)^X$;

(c) for the untested tire, determining cyclic strain amplitudes



and temperature profiles through the tire by computer solution of the heat balance equations through the tire, imposing the simultaneous condition that the above relation of step (b) between tensile moduli and strain amplitudes must be satisfied, at the existing temperature in each small region of the tire;

(d) from the surface temperatures at each small area of the untested tire, thus arrived at, calculating the sum of Q_T over the whole surface area, A, of the tire: $Q_T=\int_A h(T_s-T_a)dA$, where "h" is heat transfer coefficient from surface to surrounding air (inside and outside), and (T_s-T_a) is temperature difference between each small surface area and the air in contact therewith.

4,150,568

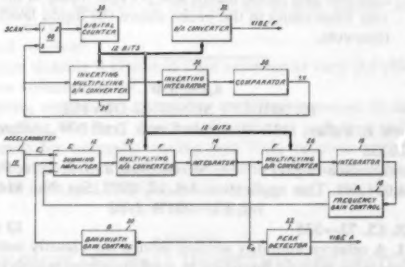
APPARATUS AND METHOD FOR DOWN HOLE VIBRATION SPECTRUM ANALYSIS

Eugene L. Berger, Houston, and Marion M. Ringo, League City, both of Tex., assignors to General Electric Company, Fairfield, Conn.

Filed Mar. 28, 1978, Ser. No. 891,010

Int. Cl.[2] E21B *47/00*

U.S. Cl. 73—151 13 Claims



11. A down hole vibration analyzer adapted for positioning in a drill string comprising:

(a) a transducer for detecting vibrations and producing a signal representative of vibrations detected;

(b) a band-pass filter connected to receive the signal from said transducer and adjustable to successivly pass frequencies of said signal falling within different pass bands;

(c) means for measuring a characteristic of the passed signal and producing an output representative thereof; and

(d) control means connected to said band-pass filter to cause it to continually change to the next successive band to be passed.

4,150,569

LEVEL INDICATOR FOR LIQUID CONTAINED IN A RESERVOIR

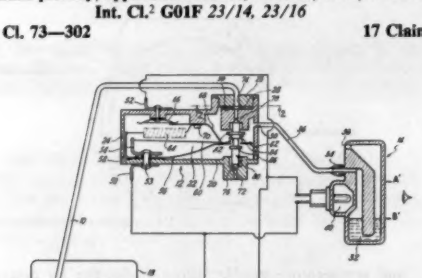
Michel Verne, Aubervilliers, France, assignor to Societe Anonyme DBA, Paris, France

Filed Nov. 14, 1977, Ser. No. 851,223

Claims priority, application France, Nov. 26, 1976, 76 35710

Int. Cl.[2] G01F *23/14, 23/16*

U.S. Cl. 73—302 **17 Claims**



1. A level indicator for liquid contained in a reservoir, comprising:

a gas pressure source including a housing defining a gas-filled chamber,

a heating resistance provided in said chamber to heat the gas filling said chamber;

an external gas reserve communicating with said chamber through a filling orifice in the housing;

probe means for connecting the reservoir to said chamber through an inlet orifice in the housing, said probe means being immersed in the liquid in the reservoir;

a liquid column manometer communicating with the chamber through a measuring orifice in the housing;

first valve means provided in said inlet orifice to control communication between the probe means and said chamber; and

a venting duct for establishing a permanent connection between the gas-filled chamber and the probe means to provide a controlled pressure drop between the gas-filled chamber and probe means and prevent liquid in the reservoir from rising in the probe above the liquid level in the reservoir.

4,150,570

HUMIDITY SENSING DEVICE

David L. Fuller, 1110 Mountain Creek Trail NW., Atlanta, Ga. 30328

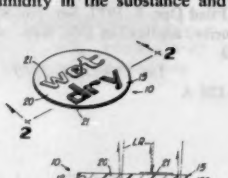
Continuation-in-part of Ser. No. 646,038, Jan. 2, 1976, Pat. No. 4,034,609. This application Jul. 12, 1977, Ser. No. 814,898

Int. Cl.[2] G01W *1/02*

U.S. Cl. 73—335 **13 Claims**

1. A relative humidity sensing device for visually indicating changes in relative humidity in a substance to which it is exposed comprising:

an indicator layer having a front viewing side and a back side, said indicator layer comprising a transparent plastic carrier material which transmits therethrough substantially the complete light spectrum incident thereon; and an inorganic salt composition dispersed in and carried by said carrier material, said inorganic salt composition having a light transmission spectrum which changes in response to changes in relative humidity so that the transmitted light spectrum provides a known visible response to changes in relative humidity, said plastic carrier material allowing moisture to enter and leave said indicator layer to expose said inorganic salt composition to the moisture generating the relative humidity in the substance and said carrier



material having a greater affinity for said inorganic salt composition than the moisture to prevent the moisture from leaching said inorganic salt composition from said carrier material, said indicator layer internally reflecting substantially no visually perceivable spectrum of the light incident thereon.

4,150,571

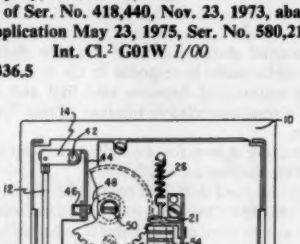
HUMIDISTAT

Thomas E. Hayes, Goshen, Ind.; Robert E. Emmons, Urbandale, Iowa, and Jon H. Bechtel, Goshen, Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Continuation of Ser. No. 418,440, Nov. 23, 1973, abandoned. This application May 23, 1975, Ser. No. 580,211

Int. Cl.[2] G01W *1/00*

U.S. Cl. 73—336.5 **1 Claim**



1. A humidistat comprising a differential transformer having a body portion with a primary winding and first and second secondary windings circumferentially wound thereon, said body portion having a central passageway extending longitudinally thereof, a movable core member extending within said passageway for coupling said secondary windings to said primary winding, and means located at each end of said core member for resiliently supporting said core member within said passageway in a spaced relationship with an inner surface thereof, excitation means for applying an excitation signal to said primary winding for coupling over said core member to said secondary windings, said first and second secondary windings being connected in series opposition such that a preselected potential difference is provided between first and second terminals of said first and second secondary windings, respectively, whenever said core member is at a first position, a humidity sensing element for sensing humidity within a given environment, and means operatively connecting said sensing element to said core member for moving said core member relative to said windings from said first position to different positions as a function of humidity sensed by said sensing element to thereby vary the signal coupling and correspondingly the potential difference between said first and second

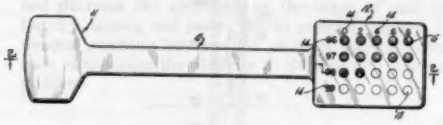
terminals as a function of changes in the humidity from a set point value as sensed by said sensing element, and output means including amplifier means for establishing a proportional band for said humidistat, said amplifier means being connected across said terminals of said secondary windings and responsive to the potential difference between said terminals to provide a DC output signal that is indicative of the humidity within said environment relative to said set point value, and means for adjusting the gain of said amplifier means to thereby adjust the proportional band of said humidistat.

4,150,572

REVERSIBLE THERMOMETER

Julius A. Lindquist, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 5, 1977, Ser. No. 857,638
Int. Cl.² G01K *11/16*
U.S. Cl. 73—356 **27 Claims**



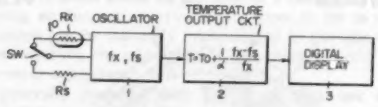
1. A thermometer including a heat sensitive material which undergoes a reversible change of state from a crystalline solid to a viscous liquid at a predetermined temperature, said heat sensitive material comprising a mixture including at least one low molecular weight organic compound and a polymer, said polymer being present in said mixture in an amount, effective to retard the rate of recrystallization of said heat sensitive material between temperatures of from about room temperature to said predetermined temperature.

4,150,573

ELECTRONIC DIGITAL THERMOMETER

Kazuhiro Iinuma, and Yukito Abe, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 2, 1977, Ser. No. 856,995
Claims priority, application Japan, Dec. 3, 1976, 51-144658; Feb. 22, 1977, 52-18579
Int. Cl.² G01K *7/16*
U.S. Cl. 73—362 AR **25 Claims**



1. A temperature measuring device comprising

oscillator means to which a temperature-sensitive resistive element and a temperature-insensitive resistive element are alternately coupled as a frequency determining element to produce a temperature-dependent frequency f_x and a temperature-independent frequency f_s alternately; and temperature output circuit means coupled to said oscillator means for providing a measured temperature value T on the basis of an equation defined by

$$T = T_O + \frac{1}{\alpha} \cdot \frac{f_x - f_s}{f_x} \text{ or } T_O + \frac{1}{\alpha} \cdot \frac{f_x - f_s}{f_s}$$

where

T_O=predetermined reference temperature

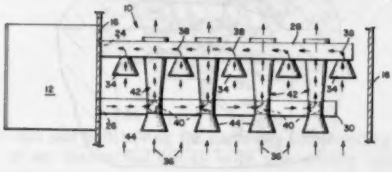
α=temperature coefficient of said temperature-sensitive resistive element.

4,150,574

FLUID SAMPLING SYSTEM

Harry Wolf, 5707 Rhodes Ave., North Hollywood, Calif. 91607

Filed Dec. 28, 1977, Ser. No. 865,115
Int. Cl.² G01N *1/22, 1/26*
U.S. Cl. 73—421.5 R **5 Claims**



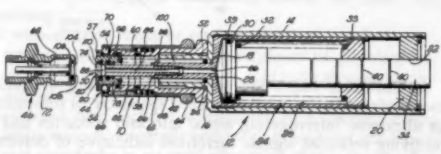
1. A fluid sampling system comprising means defining the path of flow of a fluid, a detector having an inlet and an outlet respectively for enabling said detector to sample said fluid, an impact tube having a plurality of openings coupled between said flow path means and said detector inlet and spaced across substantially the flow path for collecting representative cross-sectional samples of said fluid for supply thereof to said detector, another tube coupled to and extending from said detector outlet, a plurality of venturi tubes in said flow path means and secured to said another tube for creating a fluid pressure in said detector which is negative with respect to said detector inlet, said openings and said venturi tubes both facing into the direction of the flow of said fluid.

4,150,575

FLUID SAMPLER AND MINIMUM-INCLUDED-AIR-COUPLING

Vincent G. Magorien, Granada Hills, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Dec. 14, 1977, Ser. No. 860,302
Int. Cl.² F16L *37/22*; G01N *1/10*
U.S. Cl. 73—422 R **18 Claims**



1. A sampler for connection to a coupling receiver of a fluid system to remove a sample of fluid from said system while minimizing the quantity of included air in said sample, said sampler comprising:

a fluid receiver;

a piston slidable within said fluid receiver to vary the effective volume thereof; and

coupling means for connecting said fluid receiver to said coupling receiver, said coupling means including valve means for normally sealing said fluid receiver and for opening to admit fluid to said fluid receiver upon engagement with said coupling receiver.

4,150,576

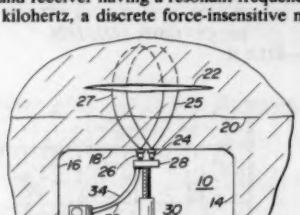
MINE ROOF AND WALL INSPECTION APPARATUS AND METHOD

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Oct. 25, 1977, Ser. No. 845,178
Int. Cl.² G01N *29/04*
U.S. Cl. 73—594 **13 Claims**

1. Apparatus comprising a vibratory energy transmitter for transmitting vibratory energy with a lobed pattern into a sur-

face of a mine, a vibratory energy receiver having a lobed pattern which can overlap said transmitter pattern, each of said transmitter and receiver having a resonant frequency between 10 and 100 kilohertz, a discrete force-insensitive mount con-



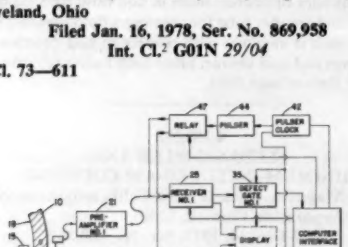
necting each of said transmitter and receiver of a support means, and adjustable means connected to said support means for forcing said transmitter and receiver into intimate contact with a surface of a mine.

4,150,577

COMPUTER CONTROLLED ULTRASONIC DEFECT GATE

Charles W. Fetheroff, Willowick, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 16, 1978, Ser. No. 869,958
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—611 **14 Claims**



1. Ultrasonic inspection apparatus comprising transducer means adapted to be coupled to a test specimen for transmitting an ultrasonic interrogating signal into said specimen and for receiving reflected signals therefrom indicative of defects in said specimen, means defining a defect gate window in which said defect signals are to be inspected, means for storing the magnitudes of a plurality of defect signals, means for comparing succeeding defect signals with the magnitudes of each of said stored defect signals, and means for causing the magnitude of a succeeding defect signal in said gate window which is greater than the magnitude of at least one of said stored defect signals to replace the smallest of said stored signals.

4,150,578

APPARATUS FOR MEASURING EXCESS PORE WATER PRESSURE

Robert B. Swartz, 117 Oberlin Terr., Lansdale, Pa. 19446

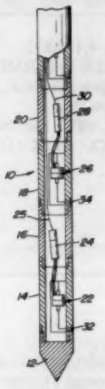
Filed Jun. 28, 1978, Ser. No. 919,896
Int. Cl.[2] G01L *9/02*
U.S. Cl. 73—725 **9 Claims**

1. Apparatus for measuring excess pore water pressure in ocean sediments and the like comprising:

(a) an elongated tubular housing having a pointed tip adapted to enter a sediment,

(b) differential pressure transducers in said housing, said transducers being supported at predetermined spaced locations by electrically insulated mounting means, each mounting means having an inlet for transmitting pore water pressure at each of said locations, each mounting means having a first diaphragm adapted to be exposed to the pore water pressure at its location, each mounting means having a second diaphragm exposed to the hydrostatic pressure in said tubing at its location,

(c) each transducer having discrete chambers, said chambers being on opposite sides of a third diaphragm, a portion of each chamber being spaced from said third diaphragm by a narrow gap, one side of said third diaphragm containing an electrolyte isolated from and responsive to said hydro-



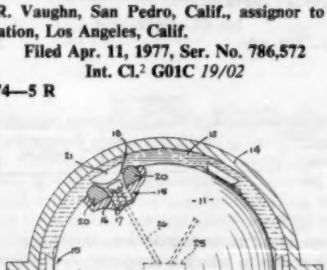
static pressure on said second diaphragm, the other side of the third diaphragm containing an electrolyte isolated from and responsive to pore water pressure on said first diaphragm, and discrete electrical wire conductors, one of said conductors being in one of said chambers, another of said conductors being in the other of said chambers, and a third of said conductors being a common conductor connected to a pair of electrodes with each electrode being exposed to one side of said third diaphragm.

4,150,579

HYDRAULIC TORQUER DEVICE FOR FLOATED INERTIAL PLATFORM

Thomas R. Vaughn, San Pedro, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 11, 1977, Ser. No. 786,572
Int. Cl.[2] G01C *19/02*
U.S. Cl. 74—5 R **9 Claims**



1. In an inertial platform supported in a casing and having a source of pressurized fluid, means for generating electrical inertial stabilization signals, a torquer system including a plurality of torquer units for torquing said platform in response to said stabilization signals to maintain the platform inertially stabilized, each of said torquer units comprising:

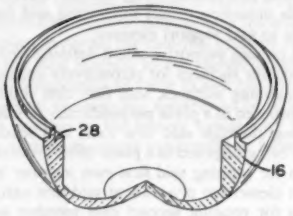
a base member mounted in the surface of the platform,
a thrust deflector in the form of a generally cylindrical section having an arcuate surface,
means for elastically supporting said deflector on said base member for limited reciprocal rolling motion thereon,
nozzle means for conveying a fluid jet from said source of pressurized fluid through said base member and against the arcuate surface of said deflector, said deflector splitting said fluid jet into a pair of jets which cause equal and opposite torsional reactions between the platform and the casing with the deflector in a predetermined neutral position,
an electrical torquer mounted in said base member adjacent to said deflector, at least a portion of said electrical stabilization signals being fed to said electrical torquer, and
a torquer armature on said deflector positioned opposite said electrical torquer for interaction therewith,
whereby said electrical torquer rotatably drives said deflector from said predetermined neutral position through a limited arc in response to the electrical inertial stabilization signals to increase the amplitude of one of said jets and decrease the amplitude of the other of said jets, thereby causing said paired jets to produce opposite but unequal reactions between the platform and the casing, such as to torque the platform to the inertially stabilized position.

4,150,580

GYROSCOPIC EXERCISER

Jerrold W. Silkebakken, Newport Beach, and Bruce H. Hale, Irvine, both of Calif., assignors to Newport Plastics, Inc., Costa Mesa, Calif.

Filed Mar. 6, 1978, Ser. No. 883,833
Int. Cl.[2] A63B *69/00, 11/04*
U.S. Cl. 74—5 R **12 Claims**



1. A gyroscopic exercising device in which a rotor is journaled for rotation about its spin axis in a casing designed for gripping, so that a countervailing moment to the moment of precession can be manually implemented to provide exercise by one exerting the countervailing moment wherein the improvement comprises:
a generally rounded shell having at least one opening therein;
a rotor within said shell mounted for extension through the opening of said shell;
a groove on the interior of said shell providing a race;
an axle supporting said rotor; and,
axle support means within said race at least partially circumferentially oriented in said race interfacing said axle and the surface of said race.

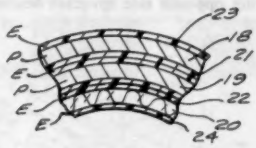
4,150,581

BELT FOR TRANSPORT OF MATERIALS AND TRANSMISSION OF POWER

Howard G. Walters, Higby Rd., Middletown, Conn. 06457

Filed Aug. 27, 1973, Ser. No. 391,856
Int. Cl.[2] B29H *7/22*
U.S. Cl. 74—238 **10 Claims**

1. A belt for transport of materials and transmission of power comprising a flat knit fabric, a cured elastomeric impregnant in said fabric and on the surface thereof, an end of said fabric joined to the remainder of said fabric to form a tube with said impregnant providing the means for joining said end to said



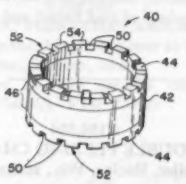
fabric and said belt having the capability of stretching up to 10% of its unstretched length with substantially complete recovery.

4,150,582

ROTOR RING FOR INERTIAL ENERGY STORAGE ROTOR

William M. Brobeck, Orinda, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 2, 1976, Ser. No. 710,956
Int. Cl.[2] F16F *15/30*; H02K *7/02, 3/48*
U.S. Cl. 74—572 **7 Claims**



1. A rotor ring for use with an inertial energy storage wheel constructed from a plurality of such rotor rings held in relative concentric relation by a connecting means, the rotor ring comprising:
an annular body member constructed from an elastomeric material reinforced with a multiplicity of generally circumferentially extending fibers, said body member including opposing end faces; and
an annular face member constructed of a fiberless elastomeric material integrally bonded to at least one end face of said ring body in co-axial alignment therewith, the face member including a plurality of openings that extend over at least a portion of the radial width of the face member and open in a direction parallel to the longitudinal axis of and away from said rotor ring, said openings being adapted to receive said connecting means.

4,150,583

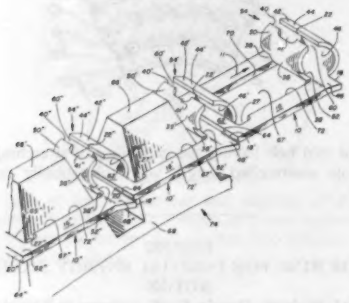
CHAIN LINK AND METHOD FOR FORMING THE SAME

Eugene W. Onulak, Huntington, Ind., assignor to Allied-Locke Industries, Incorporated, Dixon, Ill.

Filed Aug. 1, 1977, Ser. No. 820,614
Int. Cl.[2] F16G *13/02*
U.S. Cl. 74—248 **7 Claims**

1. An improved chain link comprising an integral link member including a body portion having opposite ends, a barrel located at one of said ends, a pin being located at the other of said ends, and a sprocket engaging aperture being located within said body portion between said barrel and pin; said barrel being defined by a barrel hook and flap, said barrel hook being at said one body portion end and formed toward said body portion, said flap being adjacent to said one body portion end and formed toward said barrel hook, both said flap and barrel hook having a distal end, said distal ends being adjacent

and spaced from each other, said flap having an exterior sprocket bearing surface and an interior pin bearing surface, said barrel hook having an exterior sprocket bearing surface and an interior pin bearing surface, said sprocket engaging aperture having opposite side sprocket bearing surfaces, the



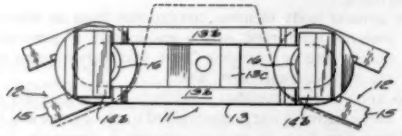
corners of said sprocket engaging aperture having a stress-relieving configuration, the width of said sprocket aperture adjacent the other of said body portion ends being greater than the width of said barrel, said flap and barrel hook each defining approximately one-half of said barrel and each are arcuate in shape.

4,150,584

DOUBLE FLEXING CHAIN

Frederik Theijsmeijer, Racine, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jul. 18, 1977, Ser. No. 816,243
Int. Cl.[2] F16G *13/06, 13/08*
U.S. Cl. 74—255 R **14 Claims**



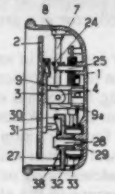
1. A chain comprising a series of pin link assemblies and bushing link assemblies, each pin link assembly including laterally spaced pin links and a pin having ends carried by said pin links and having an intermediate cylindrical section, each corresponding bushing link assembly including a center link and a bushing, said bushing being disposed between the pin links and having an outer load bearing surface and an inner cylindrical load bearing side in direct engagement with said cylindrical section of the pin, the end of the center link extending between the pin links and around the bushing and having an inner load bearing surface in direct engagement with the outer load bearing surface of the bushing, the end face of the center link being adapted for driving engagement as by the tooth of a drive sprocket, the two link assemblies being adapted to articulate on the centerline of the pin, said surfaces of the bushing and center link being tores generated by a semicircle which is minimally large in diameter than the pin and is rotated about an axis normal to that of the pin but offset therefrom toward the opposite side thereof and providing the chain with means for the pivotal movement of the center link relative to the bushing and pin link assembly about said axis for operation of the chain in a curved path.

4,150,585

CONTROL DEVICE FOR A REARVIEW MIRROR

Stephane N. Manzoni, Saint-Claude, France, assignor to Societe Manzoni-Bouchot, Saint-Claude, France

Filed Jan. 31, 1977, Ser. No. 764,309
Claims priority, application France, Feb. 12, 1976, 76 03880; Apr. 23, 1976, 76 12150; Jul. 30, 1976, 76 23427
Int. Cl.[2] F16C *1/10*
U.S. Cl. 74—501 M **18 Claims**



1. In a control device for a rearview mirror, said device comprising a support element, a mirror mounted on said support element, a casing, means connecting said support element to said casing, said connecting means including means for mounting said support element for pivoting about a first axis of rotation, means for mounting said support element for pivoting about a second axis of rotation, said first and second axes being oriented perpendicular to each other, the improvement comprising:

(a) first and second rotatable cam members, said first and second cam members defining respective first and second circular camming surfaces extending completely around the respective axes of rotation of said cam members;

(b) first and second means for rotatably mounting said first and second cam members respectively, on said casing, said rotatable mounting means supporting said cam members adjacent to said support element;

(c) means on said support element defining first and second cam follower surfaces for respectively engaging said circular camming surfaces, said first cam follower surface being disposed in a plane perpendicular to said mirror and extending through said first axis, said second follower surface being disposed in a plane offset from said first axis;

(d) means for rotating said first cam member to cause said support element to pivot about said first axis, and

(e) means for rotating second cam member to cause said support element to pivot about said second axis.

4,150,586

CONTROL MECHANISM

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Sep. 3, 1976, Ser. No. 720,299
Int. Cl.[2] G05G *5/06;* F16H *1/44*
U.S. Cl. 74—532 **9 Claims**

1. A control mechanism for shifting a control link for a hydraulically actuated differential lock mechanism between extended and retracted positions, comprising:

first and second pivoted members mounted for rotational movement about spaced apart axes and provided with cooperating surface means, the first pivoted member being a cam-like member shiftable from a retracted position through engaged and stop positions to a release position, and the second pivoted member being a pivoted catch member engageable by said first pivoted member and shiftable in response to movement of said first pivoted member;

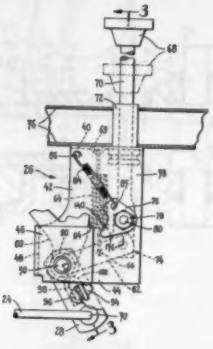
lost motion means interconnecting the cam-like member and said control link, said lost motion means being operable to cause said control link to be shifted from its retracted position to its extended position as the cam-like member is shifted from its retracted position to its engaged position,

said lost motion linkage further including means which permit the cam-like member to be shifted from its engaged position to its release position without attendant movement of the control link;

biasing means operable to bias the cam-like member towards its retracted position; and

actuator means interconnected with said cam-like member and operable upon the application of force in one direction to shift the cam-like member away from its retracted position against said biasing means;

the cooperating surface means being operable to stop the



movement of the cam-like member in its stop position as the cam-like member is being shifted away from its retracted position upon the initial application of force in said one direction, to hold the cam-like member in the engaged position as the cam-like member is biased away from the stop position after the discontinuance of the initial application of force, to permit the cam-like member to be shifted through the stop position to the release position upon a subsequent application of force in said one direction, and to then permit the cam-like member to be returned to its retracted position by the biasing means after the discontinuance of the subsequent application of force.

4,150,587

TORSIONAL VIBRATION DAMPER HAVING TWO PART HUB

Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Sep. 16, 1976, Ser. No. 724,058
Int. Cl.[2] F16F *15/i2*
U.S. Cl. 74—574 **9 Claims**

1. A torsional vibration damper including

(a) an annular inertia member,

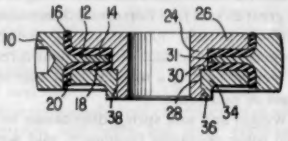
(b) a radially inwardly extending annular tongue carried by the inertia member,

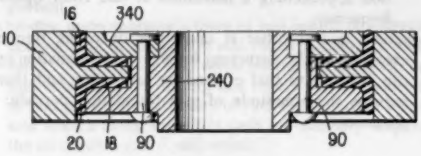
(c) a pair of annular elastic members each having a radially innermost portion and a radially outermost portion,

(d) said radially innermost portions comprising radially extending portions which sandwich the tongue,

(e) a two-piece hub,

(f) the two-piece hub sandwiching the tongue and a portion of the elastic members, the said radially outermost portions of the elastic members extending, in a longitudinal axial cross-section, in a generally axial direction and being





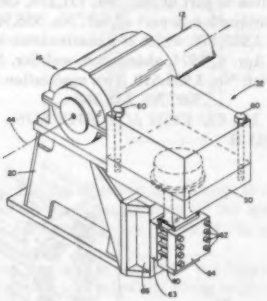
sandwiched by portions of the hub pieces and portions of the inertia member.

4,150,588

DYNAMIC VIBRATION ABSORBER

Given A. Brewer, Marion, Mass., assignor to Brewer Engineering Laboratories, Inc., Marion, Mass.

Filed Dec. 29, 1976, Ser. No. 755,268
Int. Cl.[2] F16F *15/00*
U.S. Cl. 74—574 **13 Claims**



1. In combination with an unbalanced rotor supported on a shaft journaled in a bearing for rotation about an axis of rotation, said bearing being fixed to a foundation, said rotor having a generally fixed operating frequency of rotation, said rotor in operation exerting a periodic disturbing force on said foundation, the periodic displacement of said foundation responsive to said periodic disturbing force being primarily in one displacement direction and its amplitude approaching a maximum approximately at said rotor fixed operating frequency,

a dynamic vibration absorber rigidly connected to said foundation and comprising:

a vertical integral steel spring member having an upper spring portion, a fitting end portion, and a lower supporting portion of larger cross sectional area than said upper spring portion, rigidly mounted on said foundation, said fitting end portion being adapted to support a weight,

a weight rigidly mounted on said spring member fitting end portion, said axis of rotation lying in a horizontal plane passing through said weight,

said upper spring portion having a vertical dimension, a

first horizontal dimension parallel with said displacement direction, and a second horizontal dimension perpendicular to said first horizontal dimension,

said second horizontal dimension being at least three times as great as said first horizontal dimension, increasing the stiffness of said support spring portion for bending perpendicular to said displacement direction,

said weight having a mass at least one-tenth that of the mass of said rotor,

said weight and said spring dimensions being such that at said rotor operating frequency, said weight vibrates in said displacement direction, the amplitude of said vibration approaching a maximum at said rotor operating frequency,

whereby said absorber at said rotor operating frequency exerts a periodic disturbing force on said foundation opposite in sense to that exerted by said rotor and thereby reduces the amplitude of said foundation periodic displacement.

4,150,589

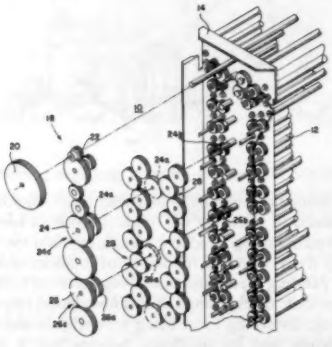
GEAR CONNECTING ARRANGEMENT

Henry F. Hope, 3192 Huntingdon Rd., Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Rd., Willow Grove, Pa. 19090

Continuation-in-part of Ser. No. 819,126, Jui. 26, 1977, which is a continuation-in-part of Ser. No. 780,922, Mar. 24, 1977, which is a continuation-in-part of Ser. No. 737,199, Oct. 29, 1976, which is a continuation-in-part of Ser. No. 555,961, Mar. 10, 1975, Pat. No. 3,989,176, which is a continuation-in-part of Ser. No. 457,829, Apr. 4, 1974, abandoned, and Ser. No. 513,244, Oct. 9, 1974, Pat. No. 3,952,610. This application Nov. 4, 1977, Ser. No. 848,388

Int. Cl.[2] F16H *1/12;* B41F *5/16*

U.S. Cl. 74—421 R **21 Claims**



1. In a transport roller rack for automatic film processing machines, which rack includes power gears simultaneously driven and supplying the main flow of power to the rack, clusters of meshing gears for supplying fractions of the main power flow to the rollers, and means for tapping off the said fractions of the power from the power gears, the tapping-off means comprising cluster drive gears coaxially rotated by power gears and driving through meshing clusters of gears, the improvement wherein:

at least one power gear and the cluster drive gear which it coaxially rotates are constituted by different portions of a single coaxial gear unit.

4,150,590

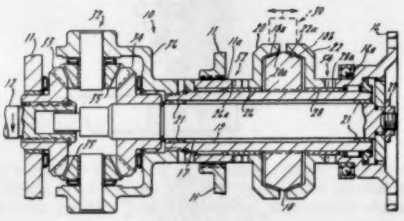
DRIVE COUPLINGS AND CLUTCHES

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 29, 1977, Ser. No. 820,182

Int. Cl.[2] F16H *3/60;* F16D *13/26*

U.S. Cl. 74—780 **19 Claims**



1. In combination, a drive coupling comprising:

a gear set **32** having rotatable gear members including input means **33** for providing unidirectional rotational input to the set, output means **34** for selectively providing bidirectional rotational output from the set and support means **36** carrying at least one interconnecting gear member **35**, the set being adapted and arranged such that, when any two of the input, output and support means are jointly rotated, unidirectional rotation of the input means **33** provides rotation of the output means **34** in either one of the two opposite rotational directions depending upon which of the two members are jointly rotated;

output means including a shaft **17** connected to the output gear member of the gear set for rotation thereby;

driving transmitting means **19** coaxial with at least a longitudinal portion of the output means shaft **17**;

a plurality of spaced rotary clutch element means **18, 20, 22** carried on drive transmitting means **19** in a serial array;

first means **52** connecting one of the clutch element means **18, 20, 22** at one end of the array to ground;

second means **54** connecting another of the clutch element means **18, 20, 22** of the array to the drive transmitting means;

the first and second connecting means being characterized in that one of them includes at least one paired set of separate and adjacent portions adapted and arranged to provide for limited axial movement of the clutch element means connected therewith and being further characterized in that the adjacent portions include a paired set of complementary, radially distributed, overlapping helical camming surfaces **52***a*, **54***a*, the surfaces of the set extending from the adjacent portions respectively, in mutual overlapping relationship, to couple the portions together over the complete range of axial movement of the clutch element means whereby engagement between the respective set of camming surfaces urging the engaged clutch element means against each other for more positive engagement; and

means **30** for selectively engaging the clutch element means of the array.

4,150,591

DEVICES FOR OPENING SCREW CAPS ON CONTAINERS

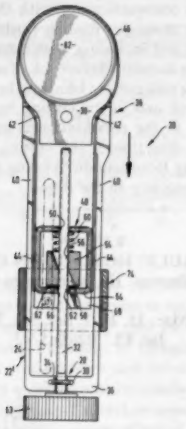
Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland

Filed Nov. 14, 1977, Ser. No. 850,928

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657887; Jul. 16, 1977, 2732203

Int. Cl.[2] B67B *7/00*; B25B *13/52*

U.S. Cl. 81—3.43 **14 Claims**



1. A device for opening a screw cap on a container, the device comprising:

a handle,

a band of material mounted by the handle so as to project therefrom in a loop to embrace such a screw cap,

tensioning means connected with the band and comprising two co-operating screw-threaded members on the handle and manually operable to tighten the band about the screw cap to be opened by contracting the size of the loop, and

adjustment means on the handle and manually operative to act upon and disengage the band tensioning means and provide a substantially coarser adjustment of the size of the loop than that provided by the band tensioning means.

4,150,592

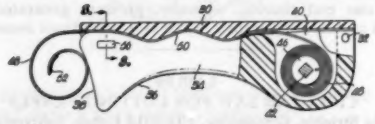
STRAP TOOL

Philip G. Mott, 2102 W. 48 Terr., Westwood Hills, Kans. 66205

Filed Aug. 24, 1977, Ser. No. 827,224

Int. Cl.[2] B25B *13/52*

U.S. Cl. 81—64 **5 Claims**



1. A wrench for gripping and exerting a turning force upon a generally cylindrical object including:

an elongate handle adapted for disposition during use with one end thereof adjacent said object and the remainder thereof extending outwardly from said object in a direction generally radial to the latter, said handle including a main body portion and a gripping lever portion mounted on said body portion and shiftable toward the latter;

an elongate relatively flexible strip of sufficient length adapting a distal portion thereof to be wrapped around the circumference of said object and into overlapped relationship upon itself; and

means for securing a second portion of said strip to said handle in manner for disposing a stretch of said strip intermediate said portions thereof in a disposition extending from said handle to the proximate extremity of said distal portion in a direction substantially parallel with said radial direction and substantially tangential to the circumference of said object, said second portion of said strip including an extension thereof extending from said stretch thereof between said body and lever portions of said handle, said extension of said strip being secured to said handle when said lever portion is shifted toward said body portion,

whereby, upon applying a force to said handle in a direction generally perpendicular to said radial direction, a tension force for tightening said distal portion of said strip upon said object and for turning said object will be transmitted to said proximate extremity of said distal portion through said stretch along a straight path substantially tangent to the circumference of said object.

4,150,593

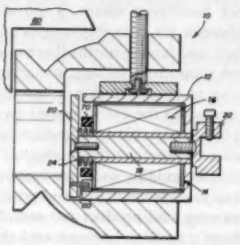
RETRACTABLE SPECIMEN HOLDER FOR A ROTARY MICROTOME

James K. Butler, 1412 Woodbine Ct., Arlington, Tex. 76012

Filed Apr. 21, 1978, Ser. No. 898,940

Int. Cl.[2] G01N *1/06*

U.S. Cl. 83—42 **22 Claims**



1. An apparatus for selective attachment to a rotary microtome in order to permit separation of the specimen from a cutting knife during the return stroke of the specimen, comprising:

(a) a frame having an external configuration which is adapted to be selectively fixed to the reciprocating mechanism of a rotary microtome;

(b) a solenoid mounted within said frame, said solenoid including a coil, a movable core, a plate fixed to one end of said movable core, and an auxiliary speciment holder fixed to the other end of the movable core;

(c) a spring mounted within the frame so as to constantly urge the plate and the movable core rearwardly away from the coil; and

(d) means including a power supply and electrical circuitry for energizing said coil when the microtome is moving the specimen holder downward past a cutting knife, and for de-energizing said coil when the microtome is moving the specimen holder upward in preparation for a subsequent cutting stroke, whereby said spring acts to retract the auxiliary specimen holder during the upward movement of said specimen holder.

16. The method of achieving selective separation between a specimen holder and a cutting knife which is affixed to the static frame of a microtome, comprising the steps of:

(a) mounting said specimen holder on a movable core of a solenoid; and

(b) alternately energizing and de-energizing the solenoid in order to alternately advance the specimen holder toward and retract it from the static cutting knife, with said speci-

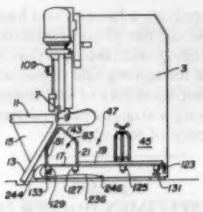
men holder generally being in a forward position during a downstroke past the cutting knife and generally being in a retracted position during an upstroke adjacent the cutting knife.

4,150,594

APPARATUS FOR HANDLING CUTTINGS FROM A SHEAR

Eugene W. Pearson, Orinda, Calif., and Wilbur G. Short, Browns, Ill., assignors to Canron, Inc., Oakland, Calif.

Filed Jul. 8, 1976, Ser. No. 703,617
Int. Cl.[2] B26D *7/18*
U.S. Cl. 83—91 **29 Claims**



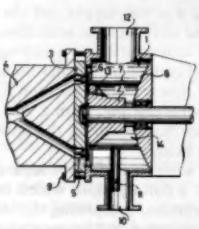
1. In combination, a machine for performing an operation on work in the course of which it may produce a work product or scrap product, said machine having a pair of side housings spanned by work modifying means, a movable product car having means thereon for movably supporting the car on a supporting surface, and having means thereon defining a product receiving and supporting section, including a bottom and sides, for receiving and supporting product therein for movement with said car when the car is moved on said supporting surface, said car being movable to a position between said side housings to receive and support the product of said machine in said section, means for guiding such product from the machine into said section of said movable car, and positive drive means for adjustably moving said product car and the product supported therein from a position between said side housings to a position readily accessible for subsequent disposition of said work product.

4,150,595

SUBWATER GRANULATING DEVICE

Reinhard Löffler, Ludwigsburg-Ossweil, and Harald Possler, Ditzingen-Heimerdingen, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1977, Ser. No. 835,138
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646309
Int. Cl.[2] B29F *3/08*
U.S. Cl. 83—171 **4 Claims**



1. A sub-water granulating device for granulating thermoplastic synthetic plastic material capable of coacting with the nozzle plate of an extruder, said device comprising in combination:

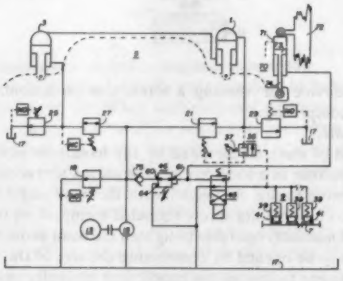
a one-way rotary cutting head including cutting tools; a dome encompassing said cutting head concentric therewith, said dome having connections for inlet and outlet of a flow of water; a tubular sleeve within said dome encompassing said cutting head coaxially therewith, one end of said sleeve being secured to an inner wall portion of the dome, said dome and said sleeve defining an annular space encompassing said cutting head coaxially therewith, said annular space communicating with the water inlet connection of the dome for feeding flushing water into said annular space and including outlet ducts for the flow of water from the annular space, each of said ducts facing the cutting tools in said cutting head and being slanted relative to the rotational axis of the cutting head and defining an angle relative to the rotational axis and in opposition to the rotational direction of the cutting head, the flushing water emerging from said ducts being discharged through the outlet connection in the dome.

4,150,596

HYDRAULIC HOLD-DOWN CIRCUIT

Wilbur G. Short, Browns, Ill., assignor to Canron, Inc., Oakland, Calif.

Filed Mar. 11, 1977, Ser. No. 776,636
Int. Cl.[2] B26D *5/42*
U.S. Cl. 83—380 **11 Claims**



1. A shear machine comprising side walls, a reciprocating ram for performing an operation on work, a work table for supporting such work, a hold-down means for holding such work to said work table during such work operation, means applying pressure to said hold-down means and means responsive to ram movement during such work operation for supplying pressure to said hold-down means, said pressure supplying means comprising a housing with an included piston coupled between one of said side walls and said reciprocating ram with said housing flow connected to said hold-down means proximate one end thereof, whereby, pressure generated from within said housing is directed to said hold-down means.

4,150,597

CIRCULAR SAW FOR CUTTING PANELS

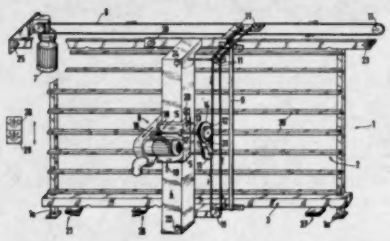
Ludwig Striebig, Grossmatte, CH-6014 Littau, Switzerland

Filed Apr. 11, 1978, Ser. No. 895,516
Int. Cl.[2] B27B *5/06*
U.S. Cl. 83—471.3 **9 Claims**

1. In an arrangement for cutting panels including a vertically extending frame for backing a panel to be cut, a horizontally extending edge rest for supporting the lower edge of a backed panel, said frame and rest defining a vertically extending work area, a vertically extending carrier member guided on said frame for horizontal movement along said area between a plurality of horizontally spaced positions in a predetermined range, a carriage mounted on the carrier member for shifting movement between a plurality of vertically spaced positions in

a predetermined range, a sawing unit including a saw blade and mounted on said carriage for movement between an operative position and a retracted position, said saw blade in said positions of the unit being located in said work area and being retracted from said area respectively, and drive means on said carriage for moving said sawing unit between said positions thereof, the improvement which comprises:

(a) a drive unit mounted in a fixed position relative to said frame; and



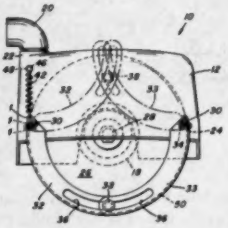
(b) motion transmitting means for transmitting motion from said drive unit to said drive means in each of said positions of said carrier member and of said carriage, said motion transmitting means including an elongated motion transmitting element trained from said drive unit to said drive means in a path extending horizontally along said frame over the entire range of said horizontal movement and vertically along said carrier member along the entire range of said shifting movement.

4,150,598

RADIAL ARM SAW GUARD

Emerson R. Berends, and Charles D. Guntharp, both of Tupelo, Miss., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1977, Ser. No. 859,829
Int. Cl.[2] B27B 9/00; B26D 7/22
U.S. Cl. 83—478 **4 Claims**



1. A guard assembly for a power saw having a cutting blade suspended above a work support, comprising:

an upper guard enclosing substantially half of said cutting blade;

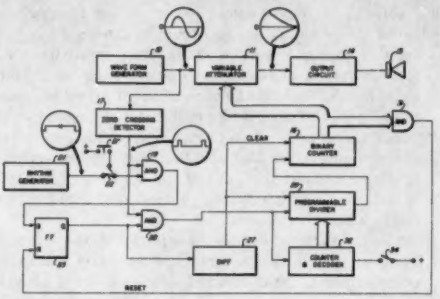
an outer lower guard assembly having a pair of leaves each with one end pivotally fixed on said upper guard and with respective lower ends being arcuately slotted and slidably connected to each other by a connecting pin, said slots having sufficient length to permit pivoting of said leaves to a position above the shaft of said power saw, and a spring biasing said leaves to an extended position, said leaves outer arcuate edges being of a radial dimension greater than said cutting blade when in said extended position.

4,150,599

DIGITAL KEYING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

James S. Southard, Union, Mich., assignor to C. G. Conn, Ltd., Oak Brook, Ill.

Filed Aug. 4, 1977, Ser. No. 821,734
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.03 **9 Claims**



1. A keying system for an electronic musical instrument including in combination:

a source of alternating current tone signals of a predetermined frequency;

variable attenuator means having an input coupled to said source of tone signals, a signal output terminal, and at least one control terminal;

a source of pulses, each said pulse representing the desired production of a sound corresponding to said tone signals;

coincidence circuit means coupled to said source of pulses and to said source of tone signals for producing a sequence of pulses coincident with the zero crossings of the alternating current tone signals whenever a pulse is supplied by said source of pulses; and

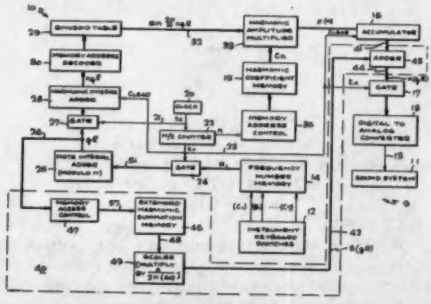
control means coupled to said coincidence circuit means and to the control terminal of said variable attenuator means, said control means receiving said sequence of pulses from said coincidence circuit means and in response thereto providing signals to said control terminal of said variable attenuator to change the attenuation thereof in coincidence with said zero crossings, whereby an attenuated tone signal is provided at the signal output terminal of the variable attenuator means.

4,150,600

COMPUTER ORGAN WITH EXTENDED HARMONICS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 10, 1977, Ser. No. 751,391
Int. Cl.[2] G10H 3/00
U.S. Cl. 84—1.11 **12 Claims**



1. In an electronic musical instrument of the type having

tone generation means for computing in real time the amplitudes at successive sample points of a musical waveshape, said means including first circuitry for separately evaluating the constituent Fourier components of order less than a certain order M, an accumulator for summing these components, and a converter for converting the obtained amplitudes to musical tones, successive amplitude computations being carried out at regular computation time intervals t_x for successive sample point values, the improvement for extending the harmonic content of the generated musical tones comprising:

a memory storing values of an algebraic approximation of the summation of individual Fourier component amplitudes for an "extended harmonic" set of such components of order greater than W, for different sample point values,

memory access control circuitry, connected to receive said sample point values from said first circuitry, for accessing from said memory the value of said approximation for the sample point at which said waveshape amplitude currently is being evaluated, and

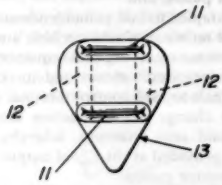
an adder for adding the accessed approximation value to the summation from said accumulator to obtain said sample point amplitude, said obtained amplitude being provided to said converter.

4,150,601

POSITIVE GRIP INSTRUMENT PICK

Horace Henley, Jr., 7505 Prairie Rd. NE., Albuquerque, N. Mex. 87109

Filed Oct. 27, 1977, Ser. No. 845,950
Int. Cl.[2] G10D *3/16*
U.S. Cl. 84—322 **8 Claims**



1. A pick device for use with a musical instrument comprising: a body having two opposing faces; a first channel formed in one of said faces adapted to cradle a human finger therein; a second channel formed in said opposing face and extending transversely of said first channel and adapted to cradle a second human finger therein.

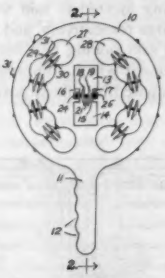
4,150,602

MUSICAL INSTRUMENT

Juan I. Santiago, Sr., 15 E. 3rd St., Lansdale, Pa. 19446

Filed Jan. 24, 1977, Ser. No. 762,116
Int. Cl.[2] G10D *13/06*
U.S. Cl. 84—402 **1 Claim**

1. A musical instrument comprising a body portion and an attached handle portion, said body portion being a flat plate having a plurality of rows of holes therein and each row having a plurality of holes making up the separate rows, the holes in each row being connected together by passageways of lesser width than the size of the holes so that hubs are formed on each side of the passageway, a pair of jingle discs disposed between



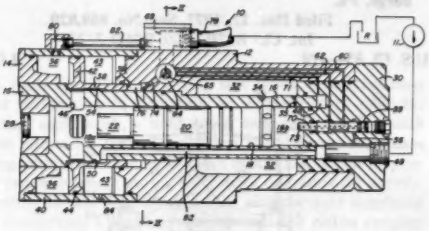
each pair of hubs, and a retaining pin passing through each pair of discs and supported by the adjacent hubs.

4,150,603

FLUID OPERABLE HAMMER

Murray D. Etherington, Aurora, Colo., and David V. Roberts, Waterloo, Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 6, 1977, Ser. No. 830,557
Int. Cl.[2] F01L *15/02*
U.S. Cl. 91—50 **22 Claims**



1. A fluid operable impactor assembly comprising:

a body having an elongated bore extending therein; a hammer piston axially movable within said bore to form a variable volume chamber therewithin;

an exhaust chamber adapted for fluid communication with exhaust fluid receiving means;

passageway means for fluid communication between said variable volume chamber and said exhaust chamber whereby said exhaust chamber is adapted to receive hydraulic fluid from said variable volume chamber;

valving means located intermediate said variable volume chamber and said exhaust chamber and cooperable with said passageway means to control fluid flow therethrough;

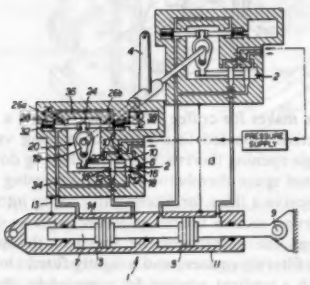
and means carried by said valving means and cooperable with said exhaust chamber for removing hydraulic fluid from said exhaust chamber only when said passageway means is open for such fluid flow.

4,150,604

BIASED PRESSURE FEEDBACK MODULE

Frederick J. Fuell, Hounslow, England, assignor to Fairey Hydraulics Limited, Hounslow, England

Filed May 23, 1977, Ser. No. 799,608
Claims priority, application United Kingdom, May 25, 1976, 21672/76
Int. Cl.[2] F15B 11/16, 13/06; F01B 15/00; F15B 9/10
U.S. Cl. 91—216 A 8 Claims



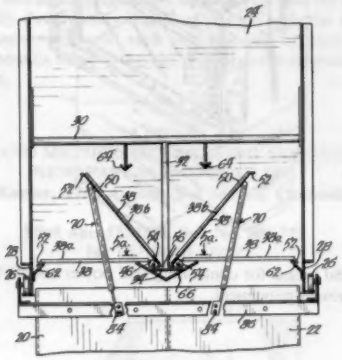
1. A servo system including at least two servo mechanisms actuated by a single control member and adapted to act on a single load, the mechanisms including hydraulic actuators having opposed piston faces exposed respectively in first cylinder chambers and in second cylinder chambers, and servo valves controlling connection of the cylinder chambers to a pressure supply and exhaust in opposite senses, a mechanical feedback connection whereby movement of the actuators in response to movement of the servo valves tends to restore the servo valves to a neutral position, and pressure feedback means comprising first and second feedback pistons having piston faces exposed respectively in first and second feedback chambers which are respectively interconnected by low-pass hydraulic filters and of which the first feedback chambers are connected to the first cylinder chambers of the hydraulic actuators, the feedback pistons being urged resiliently towards a neutral position and acting in opposition on said servo valves so connected that a rise of pressure in the first cylinder chambers and hence in the first feedbackchambers moves the valves to cause a fall of pressure in the first cylinder chambers and/or a rise of pressure in the second cylinder chambers while a fall of pressure in the first cylinder chambers produces the opposite effect, characterized in that the areas of the piston faces in the first and second feedback chambers of the pressure feedback means are unequal, whereby during operation of the system, should one of the servo valves be displaced a first distance from its neutral position into a position causing a higher pressure in, for example, the first chamber of its hydraulic actuator in an extending direction while another of the servo valves is displaced a second distance from its neutral position causing a higher pressure in the second chamber of its hydraulic actuator, tending to urge the hydraulic actuator in a retracting direction, the differential forces acting on the feedback pistons will cause the respective servo valves to be displaced in directions opposite to the respective extending and retracting directions to thereby substantially reduce the first and second distances, thus substantially reducing what may be termed a tug-of-war force between the hyraulic actuators.

4,150,605

DAMPER ARRANGEMENT FOR A TRAVELING SPRAY BOOTH

Steve E. Telchuk, Jr., Chicago; Rudolph J. Novota, River Grove, and Thomas G. Ingham, Itasca, all of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Apr. 27, 1977, Ser. No. 791,221
Int. Cl.[2] B05C 15/00; B05B 15/00; B08B 15/02
U.S. Cl. 98—115 SB 3 Claims



1. In a damper arrangement for a traveling spray booth wherein the booth is movable along tracks and fresh air is flowed through the booth and exhausted through an exhaust duct at the top of the booth, and wherein a stationary exhaust duct extends lengthwise of the tracks and includes at least one exhaust fan for removing exhaust air, the bottom of said stationary duct being formed by a plurality of dampers which are normally closed and pivotable to an open position by opening means associated with the spray booth, the improvement comprising hinge means along one edge of the dampers, said hinge means extending longitudinally of the stationary duct, said dampers being pivotable on said hinge means but being normally held closed by force of gravity, damper opening means carried by the spray booth, and a perforated diffuser plate mounted in the stationary duct below the exhaust fan to balance the flow of air in the stationary duct and thereby prevent premature opening of said dampers.

4,150,606

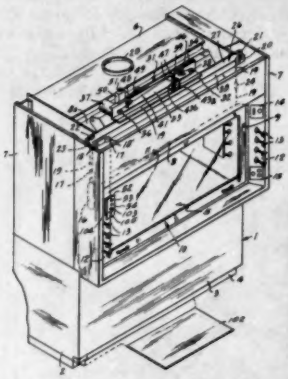
AUTOMATIC LABORATORY FUME HOOD SASH OPERATOR

Laurence N. Nelson, R.R. #1, Onsted, Mich. 49265

Filed Jun. 28, 1977, Ser. No. 810,762
Int. Cl.[2] F23J 11/00
U.S. Cl. 98—115 LH 20 Claims

1. An actuator mechanism for fume hood structures having an access opening in a wall thereof and a closure structure therefor, including a movable sash member, disposed for movement in said access opening to vary the effective size thereof, comprising a power source mounted on a stationary portion of structure and having a drive pulley, a freely rotatable idler pulley carried by said structure and spaced from said drive pulley, an actuating member, a cable extending between and over said drive and idler pulleys, said actuating member being secured to said cable with the latter extending therefrom to the respective pulleys, with such portion of the cable defining the line of travel of said actuating member for moving the latter in either direction along said line of travel, said actuating member being disposed adjacent an element of said closure structure having a movement, during operation of the latter, in the same direction as that of said actuating member, means

connecting said actuating member and the movable element of such closure structure for effecting a movement of such element, and means for controlling said power source to control such element movement.

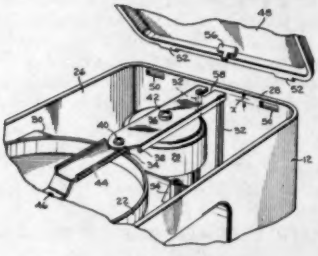


4,150,607

COFFEEMAKER GENERATOR MOUNTING

Charles L. Kemp, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.

Filed May 17, 1978, Ser. No. 906,861
Int. Cl.[2] A23F *1/00*
U.S. Cl. 99—279 **5 Claims**



1. An electric brewer for coffee and like beverages including a heated base supporting a receptacle and hot water generator, means to store and direct water from said generator to said receptacle, an improvement for mounting said generator comprising,

a single plastic molded box-shaped housing with an access opening only at one end with the other end and side walls being integrally formed,

spaced rib means formed on and extending along a side wall towards and terminating within said opening,

securing means on the opposite side wall,

a U-shaped channel member crossing said opening with its legs directed therein,

said member straddling in fixed abutment against said ribs at one edge and connected to said securing means at the opposite edge, and

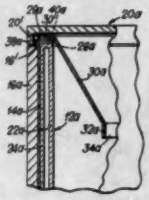
means securing said generator to said channel within the opening to fix said generator against all lateral movement and movement into said opening.

4,150,608

DRIP-COFFEE MAKER

Joseph G. Hirschberg, 1046 Alfonso Ave., Coral Gables, Fla. 33148, and Harry E. Rubens, 9101 E. Bay Harbor Dr., Bay Harbor Islands, Fla. 33154

Filed Sep. 6, 1977, Ser. No. 830,827
Int. Cl.[2] A47J *31/10*
U.S. Cl. 99—306 **3 Claims**



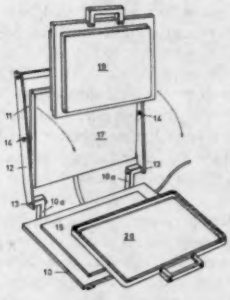
1. A drip-coffee maker for coffee storage comprising a coffee-dispersing section mounted to a coffee-containing vessel having only a single opening thereto, said vessel having double walls and evacuated space therebetween, said dispersing section adapted to receive a filter for filtering the coffee into the vessel, said dispersing section further provided with an open connection through the opening of the vessel to the atmosphere during the filtering process, and a tightly fitted closure cap provided with a resilient washer, for completely closing and sealing the opening to the vessel.

4,150,609

COOKING APPARATUS

John W. McClean, Lakemba, Australia, assignor to Breville Holdings Pty. Ltd., Pyrmont, Australia

Filed Apr. 6, 1978, Ser. No. 894,118
Claims priority, application Australia, Aug. 9, 1977, 1166/77
Int. Cl.[2] A47J *37/10*
U.S. Cl. 99—372 **4 Claims**



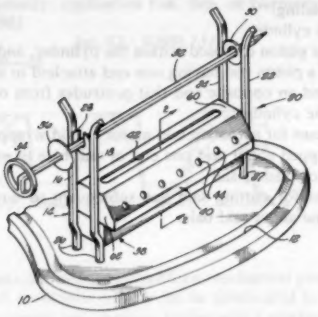
1. A cooking appliance comprising a base, a cover hingedly connected to said base, electric heating elements respectively mounted in said base and cover, a block of metal embedding the respective heating element, adapted to constitute a heat sink, and having one face presenting a relatively large area, a removable cooking plate of washable construction associated with each heat sink and having a relatively large area on one face, means provided within each cooking plate for respectively attaching the same to the base and hinged cover, each said area of the cooking plate being in intimate contact with the corresponding area of the adjacent heat sink, whereby there is an effective transfer of heat from the respective heating element to the respective cooking plate.

4,150,610

INDIVIDUAL BARBEQUE APPARATUS

Neil Ferrara, 1008 Saint George Cir., Palm Springs, Calif. 92262

Filed May 16, 1978, Ser. No. 906,522
Int. Cl.[2] A47J 37/04
U.S. Cl. 99—419 9 Claims



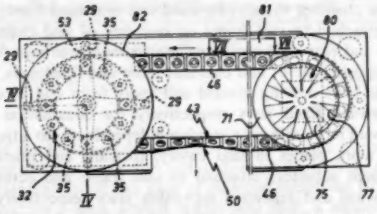
1. An individualized barbeque apparatus comprising:
mounting plate means;
support apparatus mounted to the mounting plate means, the support apparatus comprising a first support means and a second support means;
skewer means having a handle at one end and adapted for being supported between the first and the second support means; and
a burner apparatus comprising a generally elongated fuel container positioned between the first and second support means and below the skewer means, and a generally elongated lid for being positioned over the fuel container, the lid having a top portion along the length of the lid with at least one elongated flame opening therethrough and a side portion having at least one vent opening therethrough.

4,150,611

CONTINUOUS CYCLE DESTONING AND HALVING MACHINE, PARTICULARLY FOR PEACHES, APPLES AND SIMILAR FRUIT

Giorgio Bellini, Parma, Italy, assignor to Zilli & Bellini S.r.l., Parma, Italy

Filed May 24, 1977, Ser. No. 799,979
Claims priority, application Italy, Jun. 4, 1976, 46865 A/76; Jan. 10, 1977, 46801 A/77
Int. Cl.[2] A23N 3/08
U.S. Cl. 99—548 16 Claims



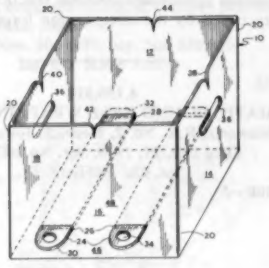
1. A continuous cycle destoning and halving machine, particularly for peaches, apples and similar fruit, comprising a continuously moving endless conveyor belt extending around two ring gears rotating on spaced vertical axes, one being a drive gear and the other a driven gear, the conveyor belt supporting a row of half cups, said conveyor belt comprising a chain, to each link of which there is externally hinged for pivotal movement about a horizontal axis, a half cup for containing fruit, an idler roller mounted on said half cup opposite said hinge of each cup and which slides on a continuous substantially horizontal rail extending around and supported by the machine frame externally of and substantially parallel to the chain, there being provided at points along said conveyor belt an atuomatic station above one of the ring gears for loading the fruit on to the conveyor belt, a fruit positioning station disposed downstream of said automatic loading station, a fruit processing station in proximity to the other of said ring gears and a discharge station for the processed fruit disposed downstream of said processing station, and wherein said rail includes a vertically downwardly displaced portion adjacent said discharge station to permit each said half cup to pivot downwardly about its hinge to thereby discharge the respective fruit therefrom.

4,150,612

MEANS AND METHOD OF BUNDLING AND STACKING NEWSPAPERS AND THE LIKE

Ruth G. Kessler, 1730 Avenida Del Mundo, Coronado, Calif. 92118

Filed Apr. 17, 1978, Ser. No. 896,725
Int. Cl.[2] B65B 13/02
U.S. Cl. 100—2 9 Claims



8. A method of bundling and stacking newspapers and the like, comprising:
(1) making a small stack of newspapers with the edges of the newspapers roughly defining four vertical sides of the stack;
(2) placing a four-sided sleeve over said stack in frictional contact with the four sides of the stack and extending thereabove to constitute a hopper;
(3) inserting a member through the sleeve above said stack to support the sleeve in said position;
(4) laying a string into and across the hopper;
(5) filling the hopper with additional newspapers;
(6) tying the additional papers into a discrete bundle;
(7) removing said member;
(8) raising said sleeve to re-define a hopper above the tied discrete bundle; and
(9) repeating steps 3–8 till a stack of bundles of a desired height is obtained.

4,150,613

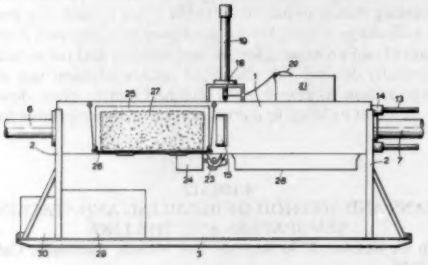
APPARATUS FOR BALING HAY OR STRAW

Gordon E. A. Smee, and Raymond W. Jackman, both of Braintree, England, assignors to Joseph Bradbury & Sons Limited, Essex, England

Continuation of Ser. No. 745,849, Oct. 28, 1977, abandoned.
This application Jan. 23, 1978, Ser. No. 871,458
Claims priority, application United Kingdom, Nov. 28, 1975, 49067/75
Int. Cl.[2] B65B 13/20
U.S. Cl. 100—3 5 Claims

1. The method of increasing the density of bales of fibrous material comprising the steps of clamping a previously pre-

pared bale of fibrous material between a piston having a preset stroke and a backing plate movable between advanced and retracted positions relative to said piston, applying to said backing plate in opposition to said compression force a constant reaction force which is less than the maximum compression force exertable by said piston, and limiting the density increase of said bale to a predetermined level by movement of said backing plate from an advanced position towards a retracted position against said constant reaction force when the latter is exceeded by the compression force exerted by said piston.

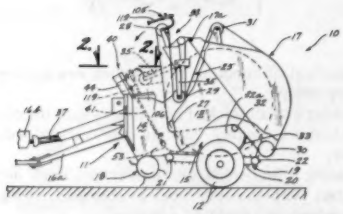


4,150,614

AUTOMATIC ROUND BALE WRAPPING ASSEMBLY

Dale R. Schwartz, R.R. No. 2, Hedrick, Iowa 52563

Filed Feb. 21, 1978, Ser. No. 882,172
Int. Cl.[2] B65B *13/18*
U.S. Cl. 100—5 **6 Claims**



1. In a machine for forming a round bale of windrowed material having a mobile main frame, bale forming means mounted on the frame, conveyor means for feeding said material to said bale forming means and for rotating said material during and subsequent to bale formation, a supply of wrapping line having a free end, and a pick-up mechanism for supplying said material to said conveyor means, the improvement of an automatic bale wrapping assembly comprising:

(a) an elongated wrapping line dispensing arm having an outer end from which said free end of said wrapping line is extended,

(b) means on said frame for movably supporting said dispensing arm,

(c) locking means for releasably securing said dispensing arm in a rest position during bale formation,

(d) coacting means on said bale forming means and said frame for automatically actuating said locking means to release said dispensing arm when a bale being formed by said machine reaches a predetermined diameter,

(e) means for moving said dispensing arm in one direction, upon release thereof by said locking means, from said standby position to a bale wrapping position wherein said free end of said wrapping line is engaged by said conveyor means for travel under the lower side and about one end of said formed bale as said bale is rotated by said conveyor means,

(f) means for moving said dispensing arm in an opposite direction to move said one end of said dispensing arm along the length of said bale and to return said arm to said rest position, said means comprising:

(1) a hydraulic motor mounted on said main frame and including:

(i) a cylinder,

(ii) a piston disposed within the cylinder, and

(iii) a piston rod having one end attached to said piston and an opposite end that protrudes from one end of the cylinder,

(2) means for actuating said motor as said wrapping line is wrapped about said one end of said bale to extend said motor piston, and

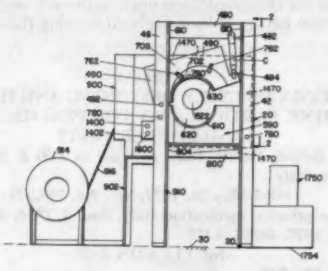
(g) means for cutting said line subsequent to wrapping of said line about said bale.

4,150,615

COMPACTOR-STRAPPER

B. Carson Russell, 12821 Marcy St., Omaha, Nebr. 68154

Filed Jun. 16, 1977, Ser. No. 807,196
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—7 **5 Claims**

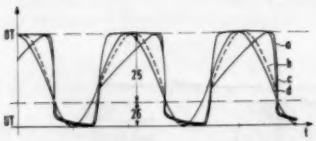


1. A compactor-strapper comprising: a frame having a work-reception chamber therein, forward and rearward fixed jaws rigidly attached to said frame on one side of said chamber, forward and rearward moveable jaws attached to said frame on an opposite side of said chamber from said fixed jaws, said moveable jaws moving toward and away from said forward and rearward fixed jaws respectively for compaction and release, said moveable jaws moving independently to adjust to uneven work pieces in said cavity, forward and rearward independent actuators attached to said frame and actuating said forward and rearward moveable jaws respectively for causing said movements toward and away from said fixed jaws, said fixed jaws and said moveable jaws each having cavities therein defining walls of said chamber, said cavities of said front and rear fixed jaws substantially facing said cavities respectively of said front and rear jaws, said forward and rearward jaws being spaced apart for providing a strapping space therebetween, and a strapping machine mounted on said frame and having strap applying portions (arranged around) at said strapping space and applying straps onto materials disposed in said chamber.

4,150,616
METHOD OF CONTROLLING THE SPEED OF A MECHANICAL PRESS

Franz Schneider, and Helmut Braitinger, both of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,347
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728982
Int. Cl.[2] B30B *15/14*
U.S. Cl. 100—35 **11 Claims**



1. A speed controlling method for a mechanical press having a crankshaft revolution which can be subdivided in principle into a discharging and charging region and a working region, wherein the speed of the mechanical press is controlled between a maximum admissible speed and a minimum possible speed, the press including a press ram, the method comprising the steps of:

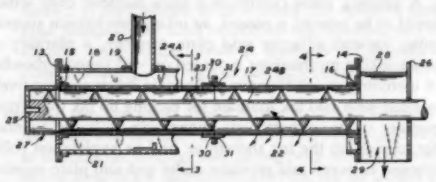
moving the press ram during the discharging and charging region and during the working region; and

controlling the movement of the press ram so that the press ram is moved at a first speed in the discharging and charging region so as to permit a trouble-free and safe discharging and charging of the press and at the maximum admissible speed during the working region so that a stoppage of the mechanical press between the discharging and charging region and the working region is unnecessary.

4,150,617
MODULAR SPLIT SCREEN HYDRO-EXTRACTOR

Eugene J. Schramm, Norristown, and Jacob C. Geisel, Jr., West Chester, both of Pa., assignors to Somat Corporation, Pomeroy, Conn.

Continuation of Ser. No. 754,162, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 647,973, Jan. 9, 1976, abandoned. This application Jun. 2, 1978, Ser. No. 911,783
Int. Cl.[2] B30B *9/14*
U.S. Cl. 100—117 **8 Claims**



1. In the hydro-extractor of the type designed to receive a mixture of liquid and solids and to dewater the mixture to form a substantially solid dry plug of material therefrom having in combination a shell, a shaft within said shell, a helical screw formed on a portion of said shaft, inlet means for introducing said mixture at one end of said screw, a cylindrical sieve surrounding said screw and concentric with said shaft, a discharge space at the other end of said screw, and means for rotating said screw within said sieve to form and move said plug axially toward said discharge space, the improvement comprising:

a plurality of cylindrical sieve sections placed lengthwise to form said cylindrical sieve;

means for securing one of said cylindrical sieve sections adjacent the inlet means;

means for securing another of said cylindrical sieve sections adjacent the discharge space;

the section adjacent the inlet means being of thin gauge material having holes of relatively small size to increase the capture of solids of the mixture, the ratio of the thickness of the thin guage material to the size of the relatively small holes being such that clogging of said small holes is substantially prevented;

the thin guage material being so constructed as to be unable to withstand the pressues of dewatering;

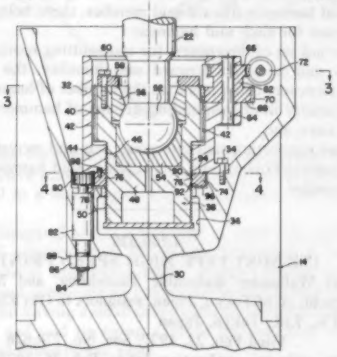
an outer cylindrical support member supporting the section adjacent the inlet means so as to withstand the pressures during dewatering, said support member having holes of relatively larger size than those in the thin guage material; and

the section adjacent the discharge space having holes of larger size than those in the section adjacent the inlet means to increase the dewatering of the captured solids.

4,150,618
PRESS HAVING SLIDE SHUT HEIGHT ADJUSTING AND LOCKING MECHANISM

Edwin A. Spanke, Oak Forest, and Louis F. Carrieri, LaGrange Park, both of Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Nov. 30, 1977, Ser. No. 856,015
Int. Cl.[2] B30B *1/06*
U.S. Cl. 100—257 **16 Claims**



1. A press comprising a frame, means on said frame providing a bed, slide means supported by said frame for reciprocation toward and away from said bed along a slide axis, means to reciprocate said slide means including a connecting rod, an externally threaded rotatable slide adjusting member coaxial with said slide axis, means rotatably and pivotally interconnecting said connecting rod and said slide adjusting member, said slide means including a threaded passageway coaxial with said slide axis and threadedly receiving said slide adjusting member for rotation of said slide adjusting member relative to said slide means to displace said slide means axially relative to said connecting rod, means for rotating said slide adjusting member, internally threaded locking nut means rotatably supported on said slide means coaxial with said slide axis and threadedly receiving said slide adjusting member, said locking nut means and said slide means including axially opposed abutment surfaces, and said locking nut means being rotatable relative to said slide means and to said slide adjusting member to displace said abutment surface of said locking nut means against said abutment surface of said slide means to force said slide means axially of said adjusting member in the direction away from said bed and to releaseably lock said slide adjustment member against rotation relative to said slide means.

4,150,619

PRINTER FOR DIFFERENT CHARACTER DENSITIES

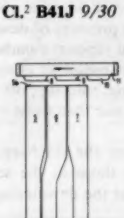
Werner Hasler, Schoenaich; Eckart Lennemann, and Subramaniam Padmanabhan, both of Herrenberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,848

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654569

Int. Cl.[2] B41J 9/30

U.S. Cl. 101—93.33 8 Claims



1. Apparatus for changing the density of printed characters recorded in a print line by a printer having a plurality of print hammers and a moving type member having a series of type elements thereon, comprising:

a first set of interposers for transmitting motion imparted to said hammers toward said member, there being one interposer for each said hammer;

a second set of interposers for transmitting motion imparted to said hammers toward said member, the number of interposers being less than the number of hammers of said plurality in corresponding groups of hammers and interposers; and

means supporting said interposer sets and movable to place a selected one of said sets between said hammers and said member.

4,150,620

INK MIST TYPE HIGH SPEED PRINTER

Akinori Watanabe; Katsuhide Tanoshima, and Matsusaburo Noguchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,626

Claims priority, application Japan, Feb. 26, 1976, 51-019429

Int. Cl.[2] B41F 15/00; G03G 21/00

U.S. Cl. 101—114 4 Claims

1. In an ink mist type high speed printer comprising a first electrode and a second electrode between which a high voltage is applied, an aperture board disposed between said first and second electrodes and adapted to selectively control passage of ions generated from the second electrode in accordance with information of the characters to be printed, and means for generating a stream of ink mist type between said aperture board and first electrode, wherein the ink mist particles are electrically charged by the ions which have passed said aperture board and the charged ink mist particles are attracted to the first electrode to print characters on a recording paper placed on said first electrode, the improvement comprising electrostatic shields disposed between said first electrode and the stream of ink mist to prevent the existence of an electric field between said first electrode and said aperture board, said electrostatic shields being composed of an insulating plate and a conductor plate, said electrostatic shields covering the parts outside of the printing space of the recording paper, and the part of first electrode not covered with the recording paper to prevent conductive materials from adhering to the reverse side of said recording paper.

4,150,621

PRINTING PRESS HAVING PLURALITY OF SEPARABLE INKING MECHANISMS

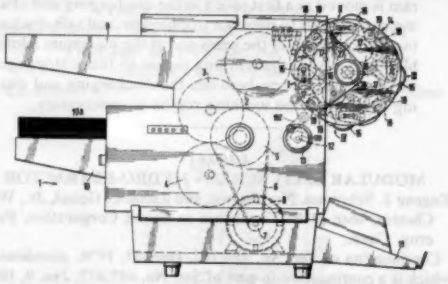
Hermann Raible, St. Georgen, Fed. Rep. of Germany, assignor to Mathias Bäuerle GmbH, Fed. Rep. of Germany

Filed Sep. 20, 1977, Ser. No. 835,001

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642580

Int. Cl.[2] B41F 31/30; B41L 27/08

U.S. Cl. 101—207 6 Claims



1. A printing press comprises a plate member over which material to be printed is passed, an inking mechanism support member located adjacent said plate member, a plurality of separate inking mechanisms mounted on said support member each including an ink fountain, a fountain roller cooperatively associated with said ink fountain for picking up ink therefrom, a spreader roller cooperatively engageable with said fountain roller to pick up the ink therefrom, and an application roller positioned between said spreader roller and said plate member for applying ink from said spreader roller to the material passed over said plate member, and mounting means mounting said ink mechanism support member with the individual ink mechanism for positioning a selective one of said mechanisms with its application roller is cooperative engagement with said plate member, said closed in fountain having an opening in the periphery thereof defining a circular cutout, said ink fountain roller being engageable in the cutout opening, said fountain having a longitudinal edge, means mounting said fountain and said fountain roller for relative movement of said fountain roller and said fountain toward and away from each other, a rotatable cam disc adjacent said fountain engageable with said fountain to move it toward and away from said fountain roller and a lever arm supporting said fountain for shifting movement relative to said fountain roller.

4,150,622

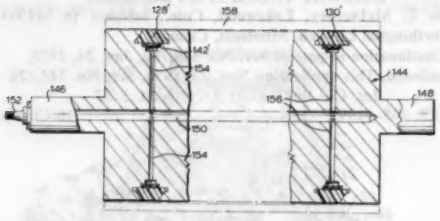
PRINTING ROLLER

Joseph A. Stollenwerk, 2489 Waterford St., Oakville, Ontario, and Reinhard Muhs, R.R. #5, Orangeville, Ontario, both of Canada

Continuation-in-part of Ser. No. 722,799, Sep. 13, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,496

Int. Cl.[2] B41F *13/10, 27/10*

U.S. Cl. 101—378 2 Claims



1. A printing roller comprising:

a mandrel extending about a longitudinal axis and adapted to be mounted in a printing machine for rotation about said axis;

a hollow cylinder slidably mounted on the mandrel and having inner and outer curved surfaces concentric with said mandrel axis;

the mandrel comprising a support having a continuous cylindrical outer surface concentric with said axis and formed with a plurality of peripheral grooves spaced longitudinally of the support, and a plurality of resilient rings disposed in each of said grooves, said rings being radially expansible into frictional engagement with said inner surface of the cylinder so as to retain the cylinder against axial displacement with respect to the mandrel, and said support being formed with at least one air passageway communicating with each of said grooves inwardly of the ring therein;

and one way air valve means accessible from externally of the roller and communicating with said air passageway so as to allow air to enter said passageway while preventing return flow of air therefrom, whereby the air in said passageway can be pressurized to cause outward radial expansion of said rings into frictional engagement with said cylinder;

and wherein each of said grooves in the support includes: an annular outer portion of generally truncated triangular shape receiving said ring; an intermediate annular portion disposed inwardly of said outer portion and receiving an annular band disposed inwardly of said ring; and an annular inner portion disposed inwardly of said band and communicating with said air passageway, whereby pressurized air in said passageway is distributed substantially uniformly in said inner portion of the groove and acts on said ring by way of said band, so as to expand the ring substantially concentrically with the axis of the roller in use.

4,150,623

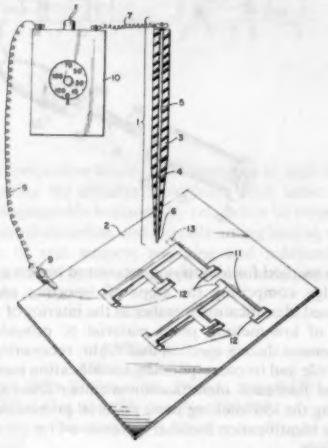
METHOD AND APPARATUS FOR CORRECTING PRINTING PLATES

Raymond R. Hamilton, Piscataway, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 659,837, Feb. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,580, Jul. 31, 1975, abandoned, which is a continuation-in-part of Ser. No. 449,476, Mar. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,118, Apr. 24, 1973, abandoned. This application Feb. 7, 1977, Ser. No. 766,276

Int. Cl.[2] B41M *5/26;* H05B *3/64*

U.S. Cl. 101—466 17 Claims



1. A system for correcting an imaged lithographic electrically conductive printing plate by the transfer of an ink receptive material to a non-imaged area of said plate, said system comprising:

(A) An elongated stylus composed of solid ink receptive material selected from the group consisting of carbon, compositions containing finely divided copper and its alloys, and compositions containing finely divided silicon, said stylus having a small cross-sectional dimension at a tip thereof and said tip being adapted for electrical contact with said lithographic plate,

(B) A source of electrical energy having a potential within the range of about 2.5 and 50 volts, said source being electrically connected to said stylus of ink receptive material and said source being adapted for electrical connection to said lithographic plate, and

(C) control means operatively connected to said source of electrical energy and being adapted to maintain a current below about 6 amperes and a power within the range of about 2 and 40 watts at said stylus tip sufficient to strike an arc when said tip is brought into contact with said nonimaged areas of said lithographic plate and said source of electrical energy is connected to said plate, but insufficient to burn said plate, whereby said ink receptive material is caused to transfer to said nonimaged area of said plate by intermittent contact of said stylus tip with said nonimaged area of said plate.

13. A method for correcting an imaged electrically conductive lithographic printing plate by the transfer of an ink receptive material to a non-imaged area of said plate comprising contacting said plate with one end of an elongated stylus composed of solid ink receptive material and having a small cross-sectional dimension at a tip thereof adapted for electrical contact with the surface of said plate and withdrawing said tip from contact with said plate, whereby a quantity of said ink receptive material is transferred to said plate,

said stylus and said plate being connected to a source of

electrical energy having a potential within the range of about 2.5 to 50 volts,

and said source including control means adapted to maintain a current below about 6 amperes and a power within the range of about 2 to 40 watts when said stylus tip is electrically contacted with said plate.

4,150,624

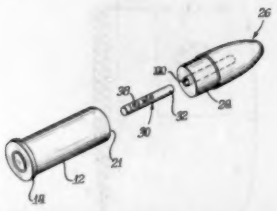
BULLET IDENTIFICATION MEANS

Michael D. Hammond, 16 Dumbarton Oaks Pl., Elgin, Ill. 60120

Filed May 26, 1977, Ser. No. 800,620

Int. Cl.[2] F42B *11/00*

U.S. Cl. 102—1 M **1 Claim**



1. A method for identifying recovered bullets ejected from a cartridge comprising the steps of: inserting and securing a hardened identification member in the interior of the projectile made of low-melting point material to provide continuous engagement during ejection and flight; recovering the ejected projectile and its corresponding identification member; removing the hardened identification member from the projectile utilizing the low-melting point material properties; and analyzing the identification member so removed for information as to its source.

4,150,625

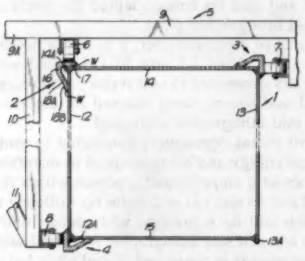
OVERHEAD CRANES

William G. Cowan, East Kilbride, Scotland, assignor to J. H. Carruthers & Company Limited, East Kilbride, Scotland

Filed Apr. 20, 1977, Ser. No. 789,081

Int. Cl.[2] B60B *13/04;* **E01B** *25/08*

U.S. Cl. 104—119 **6 Claims**



1. An overhead crane comprising an overhead box girder fabricated of elongate plates and including elongate corner joints at least two composed of first and second marginal portions of a pair of adjacent elongate plates said marginal portions being so interconnected that the first portion overhangs the second portion to provide a corner flange, a track on the box girder, and a wheeled trolley mounted on the track to convey a load along the box girder, wherein the track includes a rail at one of said corner joints, said rail being connected to the first marginal plate portion of the corner joint and extending laterally outwards beyond the corner flange of the corner joint, and an an elongate flange extending laterally from the outer edge of the rail and connected to the second marginal plate portion of the corner joint so that the flange supports the rail and the rail and its supporting flange together enclose the corner joint including the corner flange further said track on the box girder includes a longitudinally extending channel member accommodating a corner joint including the corner flange of the girder one wall portion of the channel member forming the rail and another wall portion of the channel member forming the rail-supporting flange, and said channel member is of generally V-section, so that the rail-supporting flange slopes inwards from the rail towards the second marginal plate portion of the corner joint.

4,150,626

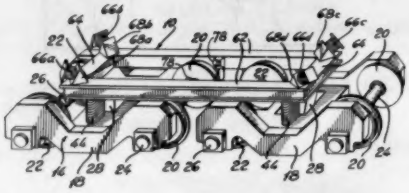
RAILWAY TRUCK SPAN BOLSTER

Frank T. McInerney, Lakewood, Colo., assignor to MLW-Worthington Limited, Montreal, Canada

Continuation-in-part of Ser. No. 543,789, Jan. 24, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,324

Int. Cl.[2] B61F *3/10, 5/20, 5/24, 5/52*

U.S. Cl. 105—199 F **16 Claims**



1. A span bolster arrangement for interconnecting a pair of railway trucks and mounting a railway vehicle chassis, the span bolster arrangement including a span bolster structure having side members interconnected by lateral members, the span bolster structure being mounted on and connected to a pair of railway trucks located beneath opposite ends of the span bolster structure, said railway trucks each having at least two axles having wheels with said wheels including under surfaces defining a plane of support, a plurality of elastic chassis support pads mounted on the span bolster structure, the plurality of elastic chassis support pads comprising primary load bearing pads and secondary stabilizing pads, said primary and secondary pads having first ends connected to said span bolster structure and second ends for connection to a lower surface of one end of a vehicle chassis to support that one end of the vehicle chassis in position above said span bolster structure; the primary load bearing pads being positioned and oriented on the span bolster structure and having compression axes extending downwardly and inwardly with all said compression axes intersecting at a virtual point on a longitudinal central plane of said span bolster structure approximately midway between said pair of trucks and at a height substantially corresponding to that of said support plane; said primary pads being in positions longitudinally of said span bolster structure wherein vertical components of compression forces receivable thereon are substantially in transverse planes defined by locations where the span bolster structure is connected to the railway truck with bending movements in said side members due to said vertical components being minimal; said secondary stabilizing pads including two pads transversely positioned on the side members of the span bolster structure and oriented so that the compression axes of said secondary pads extend upwardly and inwardly and intersect at a point in the longitudinal central plane and substantially directly above said point of intersection of the compression axes of said primary pads and at a height to stabilize an associated vehicle chassis related to said span bolster structure under normal operating conditions.

4,150,627

SELF-CONTAINED FRICTIONALLY DAMPED RESILIENT SUSPENSION SYSTEM FOR RAILCARS

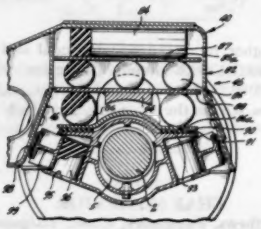
Hamilton N. K. Paton, 2521 W. Montlake Pl. East, Seattle, Wash. 98112; John B. Skilling, 3000 Webster Point Rd., Seattle, Wash. 98105, and Frank F. Smith, Albuquerque, N. Mex., assignors to Hamilton Neil King Paton and John B. Skilling, both of Seattle, Wash.

Continuation of Ser. No. 637,684, Dec. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 457,425, Apr. 3, 1974, abandoned, and Ser. No. 457,426, Apr. 3, 1974, abandoned. This application May 27, 1977, Ser. No. 801,311

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] B61F *5/26*

U.S. Cl. 105—224 A 21 Claims



1. Spring and damping apparatus for a railcar vehicle having a body and a wheeled axle, said apparatus comprising a housing connectable to the body, spring means including a plurality of horizontal vertically spaced spacer plates in said housing and a plurality of spring elements engaging respective spacer plates in element-plate-element relation, each spring element constituted by a rod spring composed of an elongated body of elastomeric material having opposed elongated longitudinal load bearing surfaces, adapter means mountable by the axle for carrying said rod springs in load bearing relation with said housing and symmetrically disposed with respect to the rotational axis of the axle such that load bearing compressive forces only are transmitted to the load bearing surfaces of each said rod spring transversely of the rod spring longitudinal axis without producing rotation of each said rod spring about its longitudinal axis with respect to said housing and said adapter means, while simultaneously therewith permitting the unloaded rod spring surfaces to bulge freely, to provide a variable rate spring force between said housing and said adapter means; and damping means including spaced downwardly diverging damping plates operatively associated with said housing, at least two friction shoes respectively engageable with said damping plates, and damping spring means operatively associated with said adapter means for biasing said friction shoes outwardly against said damping plates to provide a variable rate damping force between said housing and said adapter means.

4,150,628

TRANSVERSELY SHIFTABLE PIVOTALLY MOUNTED SCHNABEL CAR

Josef Keldenich, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

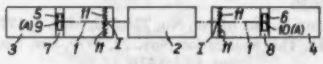
Filed Nov. 29, 1976, Ser. No. 745,770

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553503

Int. Cl.[2] B61D *3/12, 3/16, 17/00;* B61F *5/20*

U.S. Cl. 105—367 7 Claims

1. A rail vehicle for transporting heavy loads, having a pair of bogies in spaced relation and a load bridge between said bogies and having supports at its extremities extending over and supported on said bogies to interconnect said bogies, each of said supports supporting one extremity of said load bridge on a bogie for transverse and pivotal movement relative to said bogies, each bogie having outer guide means intermediate its ends supportingly engaging the support on said bogie for movement transversely of the bogie, each bogie having inner guide means engaging the support between the outer guide means and the end of the respective bogie nearest the load bridge, each said outer guide means including means slidable



laterally on its respective bogie, and abutments at each side of the bogie limiting the alidable movement, each inner guide means being displaceable horizontally relative to its respective bogie in the lateral direction, and laterally acting biasing means on each side of said support engaging and independently urging each said inner guide means toward a central position of said support on its respective bogie.

4,150,629

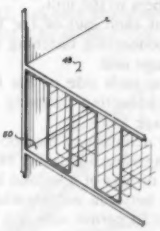
ORGANIZER

Arnold E. Santi, 8419 E. Baker St., Tucson, Ariz. 85701

Filed Oct. 6, 1976, Ser. No. 729,965

Int. Cl.[2] A47B *57/00*

U.S. Cl. 108—60 4 Claims



1. A non free standing organizer for storing horizontally insertable assorted household items, namely kitchen utensils, in horizontally accessible compartments, said organizer being insertable within a horizontally accessible unit having a horizontal shelf panel, portions of which directly support the stored items and portions of which support said organizer and further having first and second vertical shelf panels extending upwardly from the horizontal shelf panel for limiting the longitudinal extension of said organizer and thereby providing lateral support for said organizer, said organizer comprising in combination: a continuous length of bendable wire mesh material folded into a repetitive pattern of an upper horizontally oriented element, a vertically oriented element and a lower horizontally oriented element, said vertically oriented element being greater in width than said upper and lower horizontally oriented elements whereby adjacent pairs of said vertically oriented elements in combination with one of said upper and lower horizontally oriented elements define opposed sides and the top or bottom sides, respectively, of each horizontally accessible compartment of said organizer, each said compartment thereby having a greater height than width, each said lower horizontally oriented element being locatable upon the

horizontal shelf panel to receive support for and transmit support to the connected ones of said vertically oriented elements; whereby, said organizer compartmentalizes the horizontally accessible unit into a plurality of individually accessible compartments having vertical segregating elements for separating items stored within different ones of said individually accessible compartments.

4,150,630

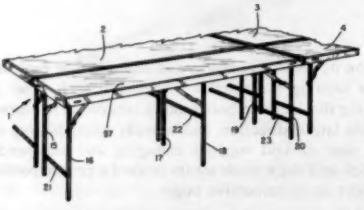
PORTABLE STAGE

Joseph E. Pokorny, 500 Saylor Way, Las Vegas, Nev. 89107, and Richard N. Keller, 2818 E. Tonopah, North Las Vegas, Nev. 89030

Continuation-in-part of Ser. No. 774,676, Mar. 7, 1977, Pat. No. 4,064,814. This application Nov. 29, 1977, Ser. No. 855,739

Int. Cl.[2] A47B *57/00*

U.S. Cl. 108—64 **7 Claims**



1. A portable stage unit capable of interlocking with other like units to form a raised stage platform comprises

a rectangular frame having two sides and two ends,

a flat, rigid floor supported by the frame, said flat rigid floor comprising a first flat, rigid member and a second flat, rigid floor member located immediately adjacent said first member, fastening means for attaching said first and second floor members to the unit,

fastening means at each end of the frame for removably engaging interconnecting fastening means at an end of a like adjacent stage unit,

fastening means at each side of the frame for removably engaging interconnecting fastening means at a side of a like adjacent stage unit,

support means for maintaining the floor in a raised, horizontal position comprising a plurality of legs of a first length, and a plurality of legs of a second length, all of the legs being movable between an extended position and a retracted position to permit selective use of legs of either length.

4,150,631

COAL FIRED FURANCE

Donald J. Frey, North Canton, and Thomas B. Hamilton, Farmington, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

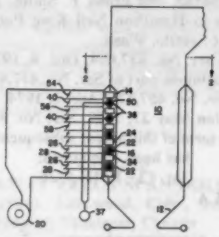
Filed Dec. 27, 1977, Ser. No. 864,181

Int. Cl.[2] F23K *1/00*; F23D *1/00*

U.S. Cl. 110—186 **11 Claims**

1. A tangentially fired pulverized coal furnace having walls, and a plurality of fuel and air introducing means located in the walls, each comprising: a cylindrical coal nozzle with its axis directed toward an imaginary circle in said furnace; means for passing a flow of primary air and coal through said coal nozzle; means for selectively spreading the flow of coal leaving said nozzle; a secondary air duct surrounding said coal nozzle; means for passing flow of secondary air through said secondary air duct, whereby the secondary air intersects the spread flow of coal; and means for selectively varying the air flowing through said secondary air duct between a swirling flow pattern and a parallel flow pattern.

9. A method of operating a pulverized coal burning furnace comprising: at a low rating introducing coal and primary air through nozzles projecting tangent to an imaginary circle in the furnace, and deflecting the coal outwardly from the axis of the nozzles, introducing a swirling flow of secondary air surrounding said nozzles and intersecting the deflected coal



stream; at a higher rating introducing coal and primary air through said nozzles with minimal deflection of coal from a line of flow parallel to the axis of said nozzles, and introducing as a parallel flow stream the secondary air which was swirling at low rating.

4,150,632

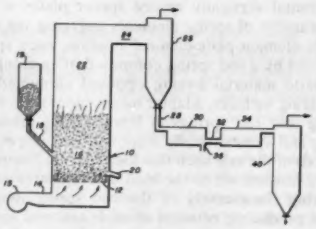
CHAR SEPARATOR

Francis T. Matthews, Poquonock, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 2, 1977, Ser. No. 847,862

Int. Cl.[2] F23B *1/00*

U.S. Cl. 110—342 **26 Claims**



1. A fluidized-bed furnace system, comprising:

a. a fluidized-bed furnace in which carbonaceous fuel particles are burned in the presence of inert particles, gaseous combustion products thereby being produced, which combustion products entrain particulates including inert particles and char particles;

b. means for removing the particulates from the gaseous combustion products;

c. conduit means connected to the furnace and the removal means to conduct the gaseous combustion products from the furnace to the removal means;

d. means for receiving the particulates removed by the removal means and separating them into portions of relatively high and low densities, whereby the char particles are concentrated in the portion of relatively low density and the inert particles are concentrated in the portion of relatively high density;

e. a char-burning furnace, connected to the separating means to receive the portion of relatively low density, for burning the low-density portion of the particulates; and

f. conduit means connected to the separating means for removing the portion of relatively high density from the fluidized-bed furnace system.

10. A method of operating a fluidized-bed furnace system, comprising the steps of:

a. injecting carbonaceous fuel particles and inert particles into the furnace;

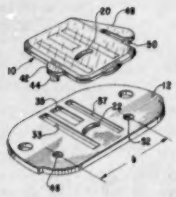
b. fluidizing the particles, thereby causing a fluidized mixture of carbonaceous fuel and inert to occupy the furnace;
c. burning the fluidized mixture, thereby producing combustion-product gases having particulates entrained therein, the particulates including char particles and inert particles;
d. removing the particulates from the combustion-product gases;
e. separating the removed particulates into portions of relatively high and relatively low densities, the low-density portion thereby having a higher char concentration than the high-density portion and the high-density portion thereby having a higher inerts concentration than the low-density portion,
f. burning the low density portion; and
g. removing the high-density portion from the fluidized-bed furnace system.

4,150,633

SNAP-ON DARNING AND EMBROIDERY PLATE

Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,302
Int. Cl.[2] D05B *73/12*
U.S. Cl. 112—260 **1 Claim**



1. A one-piece plastic feed dog cover plate for a sewing machine attachable to a needle plate having a needle aperture and feed dog openings therein, the cover plate and needle plate including mutually engageable parts by means of which the cover plate can be secured to the needle plate in a position overlying the feed dog openings, said cover plate being of a resilient plastic and including as an integral part thereof a single flexible arm, the mutually engageable parts of the needle plate and cover plate including a pin located on the underside of the arm to move with the arm and another pin in a fixed position on the underside of another portion of the cover, said mutually engageable parts also including openings in the needle plate to mate with said pins, and the pins on the cover plate being located to require the flexible arm to be laterally displaced from its unflexed position before the cover plate is secured to the needle plate.

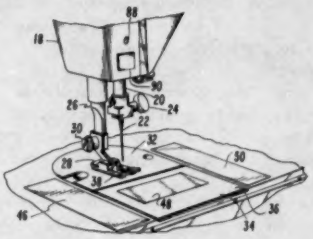
4,150,634

INTEGRATED MOTOR CONTROLLER FOR SEWING MACHINES

Jack Brown, Union; John A. Herr, Garwood; Wesley R. Peterson, Bound Brook, and John W. Wurst, Dover, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 19, 1978, Ser. No. 907,459
Int. Cl.[2] D05B *69/22*
U.S. Cl. 112—275 **12 Claims**

1. A motor controller for a sewing machine having an electrically operable drive motor, a needle bar, an armshaft including means for connecting said needle bar to said drive motor for endwise reciprocatory stitch forming motion of said needle bar toward and away from a stitch forming location, at least one control member disposed in close proximity to said stitch forming location, said control member comprising at least one momentary contact switch having an open position and a closed position, said momentary contact switch being operable by light hand pressure of a sewing machine operator and connecting said drive motor to a source of electrical power, said control member remaining closed only when said light hand pressure remains on said momentary contact switch, a selector means for selecting which of said control members will acti-



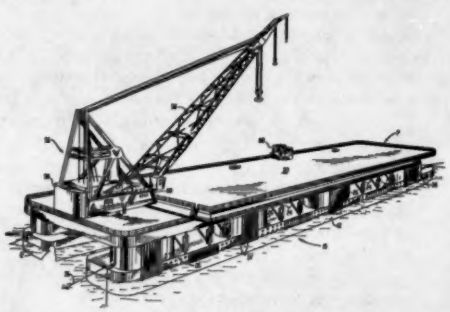
vate said drive motor, a reset circuit which disconnects said control members from said drive motor after said control members have remained open for a specified interval of time, and an operator influenced reset means for resetting said reset circuit.

4,150,635

TWIN HULL SEMI-SUBMERSIBLE DERRICK BARGE

Samuel H. Lloyd, III, Mill Valley, and Yoram Goren, Los Angeles, both of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Division of Ser. No. 650,953, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 486,588, Jul. 8, 1974, abandoned, which is a division of Ser. No. 161,865, Jul. 9, 1971, Pat. No. 3,835,800, which is a continuation of Ser. No. 705,175, Feb. 13, 1968, abandoned. This application Oct. 13, 1976, Ser. No. 732,117
The portion of the term of this patent subsequent to Sep. 17, 1991, has been disclaimed.
Int. Cl.[2] B63B *35/02*
U.S. Cl. 114—61 **53 Claims**



1. A column stabilized semisubmersible barge for marine construction, pipelaying and like other offshore operations, said barge consisting of a pair of elongated hulls disposed in substantially parallel spaced side-by-side relation with each of said hulls spaced from and lying on an opposite side of the longitudinal centerline of said barge, and said barge further comprising:
a working platform spaced above said hulls a predetermined height and normally lying in a generally horizontal plane;
means for supporting said platform in fixed spaced relation above said hulls including at least three pairs of upstanding columns connecting with each of said hulls and said platform; each of said columns having a substantially constant cross sectional area over the effective height of the column between the platform and associated hull;

each of said hulls having, over substantially the entire length thereof, a substantially rectangular transverse cross section with its breadth greater than its height;

a plurality of longitudinally spaced structural truss means interconnecting and reinforcing the structural relationship of the hulls, platform and columns, with such truss means including substantially transversely extending members structurally interconnecting uppermost portions of the hulls;

said barge being generally rectangular in plan with the length of said barge along its longitudinal centerline and roll axis being at least about 2.0 times greater than the width of said barge along its transverse centerline and pitch axis;

at least three of said columns being located on each of said two hulls on opposite sides of the barge's roll axis with pairs of such columns being located near opposite ends of each of said hulls on opposite sides of the barge's pitch axis and another pair of said columns being located at an intermediate position on each of said hulls;

each of said columns having an oblong cross section with a dimension extending in the direction of the barge's longitudinal axis greater than the column's dimension extending transversely of this barge axis;

the centroid of the cross section of each column on said hulls lying outboard of the longitudinal centerline of the associated hull;

the configuration and cross-sectional areas of said columns throughout effective height thereof and the distances of said columns from the barge's longitudinal roll axis and transverse pitch axis being such that said columns provide sufficient righting moments about roll and pitch axis when the barge is in high draft semisubmerged operating positions and also being such that said columns providing righting moment about the transverse pitch axis which is greater than righting moment provided about the longitudinal roll axis when the barge is in semisubmerged column stabilized operating positions;

said hulls having ballast compartments;

means for ballasting said barge when required to alter its draft between a low draft hull-supported floating condition in which the hulls have freeboard with said transversely extending members structurally interconnecting uppermost portions of the hulls being disposed above the mean waterline and a high draft semisubmerged column stabilized floating and operating condition in which the mean waterline is located along intermediate portions of said columns above said hulls and below the underside of said platform;

crane means mounted on said barge for transferring loads between spaced positions on said platform, said crane means being of sufficient size and capacity for various marine construction, pipelaying and other like offshore operations;

said means for ballasting including means for adjusting vessel angle of heel change caused during semisubmerged barge and crane means operations to provide a reduction of the barge's angle of heel about its roll axis when required during semisubmerged column stabilized barge and crane means operations; and

said means for ballasting including means for adjusting vessel angle of trim change caused during semisubmerged barge and crane means operations to provide a reduction of the vessel's angle of trim about its pitch axis when required during semisubmerged column stabilized barge and crane means operations.

4,150,636

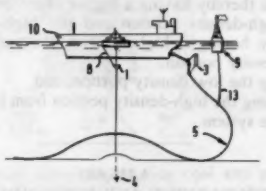
DEEP WATER BERTHING SYSTEM FOR VERY LARGE CARGO CARRIERS

Roy W. Lundh, Glendora, Calif., assignor to Roy Walfrid Poseidon Marketing & Development Co., Glendora, Calif.

Continuation-in-part of Ser. No. 652,281, Jan. 26, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 853,011

Int. Cl.[2] **B63B** *21/00*

U.S. Cl. 114—230 **2 Claims**



1. An off-shore berth for a ship comprising

first and second barges spaced apart from one another to provide a berthing space for ships, each barge having means for mooring a ship thereto,

a keel beam,

adjustable coupling means for coupling the keel beam between the barges but below the keel of a ship moored between the barges, and

a permanent anchor means coupled to the keel beam, and

wherein the keel beam comprises an exterior sub-beam of triangular cross-section and an interior sub-beam also of triangular cross-section within the exterior sub-beam, the apices of the interior sub-beam triangular cross-section being in contact with the sides of the triangular cross-section of the exterior sub-beam at substantially the mid points of the said sides.

4,150,637

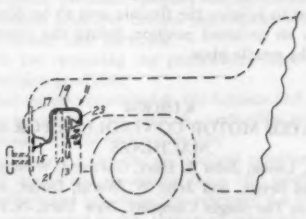
ULTRASONIC DEVICE FOR SCARING ANIMALS FROM A MOVING VEHICLE

Monroe Penick, 509 St. John's Dr., Sherman, Ill. 62684

Continuation-in-part of Ser. No. 703,946, Jul. 9, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,190

Int. Cl.[2] **B60Q** *5/00*

U.S. Cl. 116—58 R **6 Claims**

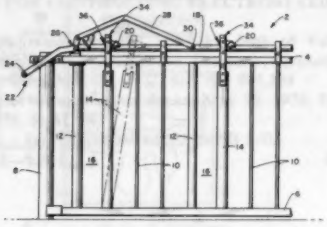


1. An accessory for a ....ving vehicle for scaring birds and/or animals away from the path of movement of said vehicle, said accessory comprising: an air scoop adapted to be fixed to said vehicle and positioned for collecting and speedwise proportionately compressing air in response to operation of said vehicle, whistle means connected to means constructed to forwardly emit sound at a frequency that is substantially above the audible range of the human ear, and means including a tube for operatively connecting said air scoop to said whistle means for continual sound emission therefrom and speedwise volumetrically in response to said operation of said vehicle.

4,150,638
LOCKING STANCHIONS FOR CATTLE

Ben W. Vandenberg, 17226 Roseton Ave.; August Vandenberg, 17306 Roseton Ave., both of Artesia, Calif. 90701, and Andrew W. Vandenberg, 15751 Ryon St., Bellflower, Calif. 90706

Filed Mar. 18, 1977, Ser. No. 779,169
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—148 12 Claims

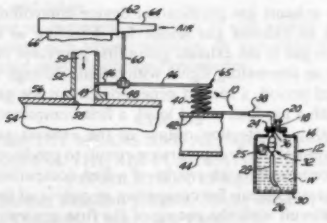


1. In multiple stanchion construction having vertically spaced upper and lower horizontal support members, intermediate vertical support posts and spaced swing pipes defining spaced positions for accommodating cattle in spaced, captive relationship, the improvement which comprises: a draw bar extending the length of and operatively supported relative to said upper horizontal support member from each of said spaced swing pipes; a plurality of spaced locking slots in said draw bar adjacent each of said swing pipes; a locking member pivotally supported from the upper terminii of each of said swing pipes and being normally urged into engagement with said draw bar and said spaced slots, said locking member having a rectangular configuration and being integrally formed by a central web and opposed, lateral, connected parallel legs, said web having an aperture for abutting engagement of one of said slots of said draw bar when said locking member is in the locked position, said swing pipes and cooperating locking members being selectively positionable in a locked and unlocked position; and actuator means for the horizontal movement of said draw bar to simultaneously move each of said swing bars, having its associated locking member in the engaged position with said adjacently positioned slot of said draw bar, into the locked and unlocked positions.

4,150,639
GASOLINE ENGINE FUEL SAVER

Frank J. Buszek, 19626 Woodmont, Harper Woods, Mich. 48225

Filed Sep. 26, 1977, Ser. No. 836,547
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 B 2 Claims



1. A fuel saver for a gasoline-fueled internal combustion engine having a vacuum supply source such as an air cleaner, an intake manifold, an exchaust manifold, and a carburetor with a gasoline vapor outlet duct discharging gasoline vapor into said intake manifold, said fuel saver comprising

a water container having a lower portion adapted to hold a supply of water and an upper portion having a water filling connection therein,

a water vapor supply conduit having an inlet disposed below the intended water level in said water container and an outlet adapted to extend into the gasoline vapor outlet duct of the carburetor,

and a vacuum supply conduit connected to said water vapor supply conduit and adapted to be connected to the vacuum supply source of the engine,

said water vapor supply conduit including a heat exchanger adapted to be disposed adjacent the engine exhaust manifold in heat-receiving relationship therewith,

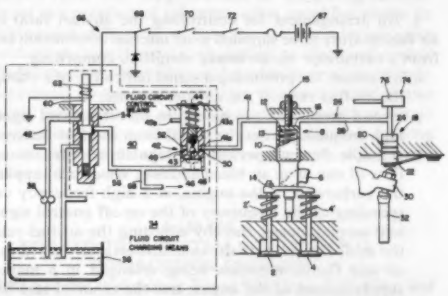
said water vapor supply conduit including a water filter connected in series therewith and disposed within said water container,

said water filter including a filter casing connected to and depending from said upper portion of said water container, and a mass of porous filter material disposed within said casing.

4,150,640
FLUIDIC EXHAUST VALVE OPENING SYSTEM FOR AN ENGINE COMPRESSION BRAKE

John J. Egan, Canton, Ohio, assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 20, 1977, Ser. No. 862,645
Int. Cl.[2] F02D *13/04*
U.S. Cl. 123—97 B 13 Claims



1. A braking system for a fuel injected internal combustion engine having at least one piston reciprocatively mounted within a cylinder for cyclical successive compression and expansion strokes and an exhaust valve operable against variable closing bias to exhaust gas from the cylinder in variable timed relationship to the piston strokes to operate the engine in either a power mode or a braking mode and having a fuel injector train mechanically actuated near the end of each compression stroke of the piston to inject fuel into the cylinder when the engine is operated in the power mode, said braking system comprising:

a. fluid pressurizing means mechanically linked with the fuel injector train for pressurizing a non-compressible fluid in response to the mechanical actuation of the fuel injector train whenever the engine is operated in the braking mode;

b. actuating means fluidically linked to said pressurizing means and mechanically linked to the exhaust valve for opening the exhaust valve whenever the level of pressurization of the non-compressible fluid is sufficient to overcome all forces biasing the exhaust valve to a closed position; and

c. valve opening delay means for preventing the opening of the exhaust valve upon pressurization of the non-compressible fluid whenever the variable closing bias on the exhaust valve exceeds a predetermined limit and for maintaining the exhaust valve closed until the variable closing

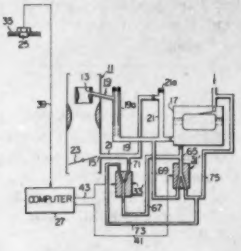
bias again falls below the pre-determined limit, thereby preventing fluid pressure buildup above a pre-determined magnitude which would tend to damage the fuel injector train.

4,150,641

ARRANGEMENT FOR CONTROLLING AN AIR-FUEL RATIO OF AN AIR-FUEL MIXTURE OF AN INTERNAL COMBUSTION ENGINE

Takatoshi Masui, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 15, 1977, Ser. No. 816,077
Claims priority, application Japan, Feb. 28, 1977, 52-20178
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 EC **6 Claims**



1. An arrangement for controlling the air-fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine from a carburetor via an intake manifold, comprising:

a first means for producing a signal indicative of a change in the air-fuel ratio of the air-fuel mixture;

a second means for producing an on-off control signal of high frequency from the signal from the first means; and

two fluidic elements performing regulation of the amount of flow of one of an air bleed and fuel, which are supplied to the carburetor of the engine, at a high frequency corresponding to the frequency of the on-off control signal of said second means, thereby adjusting the air-fuel ratio of the air-fuel mixture to the stoichiometric air-fuel ratio, one of said fluidic elements being arranged in a main fuel supply system of the engine and the other of said fluidic elements being arranged in a low-speed fuel supply system of the engine.

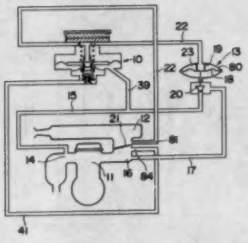
4,150,642

DIAPHRAGM-OPERATED PRESSURE CONTROL VALVE ASSEMBLY

Masami Inada, Toyoake; Kenji Hashimoto, and Yukio Suzuki, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 15, 1977, Ser. No. 816,146
Claims priority, application Japan, Jul. 19, 1976, 51-85857
Int. Cl.[2] F07M *25/06*
U.S. Cl. 123—119 A **9 Claims**

6. In a pressure control valve assembly for use in an exhaust gas recirculation system responsive to engine developed vacuum and engine exhaust gas pressure and having an access line to atmospheric pressure including a hollow body having port means in fluid flow communication with said vacuum, said exhaust gas pressure and atmospheric pressure, a diaphragm means movably secured within the body having a central portion and radially extending upper and lower partition members the outer peripheries of which being secured to the walls of said body for dividing the body into first, second and third chambers, said first chamber in communication with said vacuum, said second chamber being between said upper and lower partition members and in communication with said exhaust gas pressure and said third chamber in communication with said atmospheric pressure, first adjustable biasing means for urging said diaphragm means downward and second biasing means for urging said diaphragm means upward, and a valve member operatively associated with the movement of said diaphragm means and responsive to said vacuum, said exhaust gas pressure and said first and second biasing means to control said atmospheric pressure line, the improvement comprising:



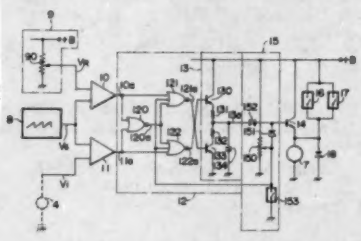
said lower partition member having a radially descending slope from said central portion, the periphery of said lower partition member being secured to the walls of said body at a lever lower than any other point on said lower partition member for preventing the collection of liquid or particulate ingredients on said lower partition member and permitting expulsion of said ingredients through said port means in communication with said second chamber.

4,150,643

CAR EXHAUST GAS PURIFICATION DEVICE CONTROLLING CIRCUIT

Takao Sasayama, Hitachi; Torazo Nishimiya, Mito, and Shinichi Sakamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1977, Ser. No. 756,715
Claims priority, application Japan, Jan. 21, 1976, 51/4957
Int. Cl.[2] F02M *7/24*
U.S. Cl. 123—119 EC **6 Claims**



1. A car exhaust gas purification device controlling circuit comprising an exhaust gas sensor for detecting at least one composition gas in the exhaust gas, a first generator circuit for generating an alternating signal with a finite voltage variation rate of fixed period, a second generator circuit for generating a signal with a predetermined level, a first comparator circuit for comparing a detection output of the exhaust gas sensor with an output of the first generator circuit to produce a binary signal in accordance with results of a first comparison, a second comparator circuit for comparing an output of the second generator circuit with the output of the first generator circuit to produce another binary signal in accordance with results of a second comparison, a deviation to time converting circuit connected to receive two binary signals representative of outputs of the first and second comparator circuits for calculating a deviation between the two binary signals in the form of a time width thereby to effect a deviation to time conversion, an integrator circuit for integrating an output of the deviation to

time converting circuit, and an electromagnetic valve provided for a carburetor and driven by a signal corresponding to an output of the integrator circuit, whereby the electromagnetic valve is driven to control a weight percent of air-fuel mixture supplied to an engine to a predetermined theoretical air-fuel ratio and proximity thereof.

4,150,644

METHOD FOR CONTROLLING ELECTROSTATIC FUEL INJECTORS

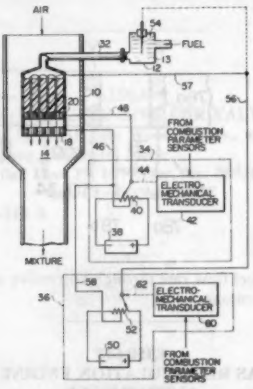
Kenji Masaki, and Hiroyuki Maruoka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 27, 1977, Ser. No. 801,395

Claims priority, application Japan, May 29, 1976, 51-61783; May 29, 1976, 51-61784

Int. Cl.[2] F02M *51/02*; B05B *5/02*

U.S. Cl. 123—119 E **4 Claims**



1. A method for operating a fuel injector mounted in an air intake passage of an internal combustion engine, the fuel injector comprising a plurality of threadlike tubes each connected at one end to a source of fuel, a control electrode adjacent to other ends of said threadlike tubes and an accelerator electrode spaced from said control electrode remote from said other ends of said tubes, said method comprising:

applying a high potential to said accelerator electrode with respect to fuel charging electrode means so that fuel is electrostatically charged with respect to said accelerator electrode and an electrostatic field is established between said accelerator electrode and a mass of fuel in said other ends of said tubes thereby causing the fuel in said tubes to be ejected therefrom to said accelerator electrode;

applying a lower potential to said control electrode with respect to said accelerator electrode to modify said electrostatic field for controlling the amount of fuel ejected from said tubes;

detecting an operating parameter of said engine; and

modulating said lower potential in accordance with the detected engine operating parameter.

4,150,645

CIRCUIT MEANS AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

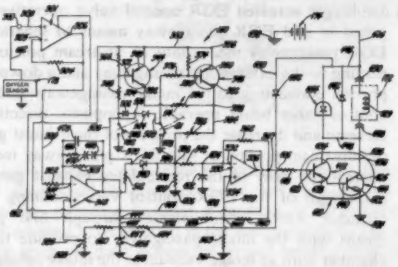
John G. Berent, Madison Heights, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 19, 1977, Ser. No. 825,948

Int. Cl.[2] F02N *3/00*

U.S. Cl. 123—119 EC **22 Claims**

1. A carburetor for a combustion engine, comprising induction passage means for supplying motive fluid to said engine, a source of fuel, main fuel metering system means communicating generally between said source of fuel and said induction passage means, idle fuel metering system means communicating generally between said source of fuel and said induction passage means, and a closed-loop feedback fuel control system, said system comprising selectively controlled modulating valving means effective to controllably alter the rate of metered fuel flow through each of said main fuel metering system means and said idle fuel metering system means, first electrical circuit means effective for sensing the oxygen content within the exhaust gases of said engine and in response thereto controlling said valving means, said first electrical circuit means comprising oxygen sensor means effective for sensing the relative amount of said oxygen in said exhaust gases and producing in response thereto an electrical output signal, said system being free of any means to monitor any exhaust gas component other than oxygen, means for comparing said output signal to a preselected reference value, amplifier means for amplifying any difference as between said preselected value and said output signal and for producing an electrical control signal effective for controlling said modulating valving means, and additional circuit means effective during selected engine operating parameters for rendering said first electrical circuit means ineffective for controlling said modulating valving means in response to said relative amount of said oxygen sensed in said exhaust gases.



4,150,646

EGR CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

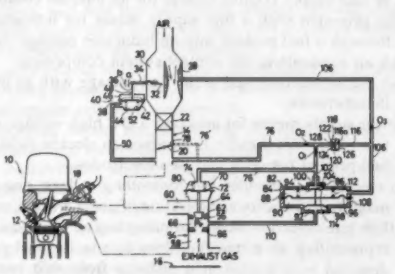
Syunichi Aoyama, Yokohama; Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 19, 1977, Ser. No. 834,422

Claims priority, application Japan, Sep. 21, 1976, 51/113307

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **25 Claims**



1. An exhaust gas recirculation (EGR) control system in combination with an internal combustion engine including an intake passageway providing communication between the atmosphere and the combustion chamber of the engine, a throttle valve rotatably disposed in the intake passageway, an exhaust gas passageway providing communication between the combustion chamber and the atmosphere, and an electroni-

cally controlled fuel injection system having a fuel injector disposed in the exhaust gas passageway downstream of the throttle valve, said EGR system comprising:

a venturi formed in the intake passageway upstream of the throttle valve;

bypass passage means providing communication between portions of the intake passageway upstream and downstream of said venturi;

valve means for opening and closing said bypass passage means in accordance with an engine operating parameter;

EGR passageway means providing communication between the exhaust gas passageway and the intake passageway to recirculate exhaust gases back to the combustion chamber;

a diaphragm actuated EGR control valve operatively disposed in said EGR passageway means to separate said EGR passageway means into an upstream portion connecting to the exhaust gas passageway and a downstream portion connecting to the intake passageway, said EGR control valve being operable in opposite directions to increase and decrease the pressure of the exhaust gases in the upstream portion of said EGR passageway means to control the flow of the recirculated exhaust gases, the diaphragm of the EGR control valve defining a first chamber which communicates through first passage means with the intake passageway to provide the first chamber with an intake vacuum in the intake passageway;

control means for controlling the intake vacuum provided to the first chamber of said EGR control valve to increase and decrease the exhaust gas pressure in the upstream portion of said EGR passageway means in accordance with a decrease and an increase in the exhaust gas pressure in the upstre..m portion, respectively, and in accordance with a decrease and an increase in a venturi vacuum in said venturi, respectively.

4,150,647

FEEDBACK FUEL SUPPLY CONTROL SYSTEM HAVING ELECTROSTATIC FLOW RATE REGULATOR FOR INTERNAL COMBUSTION ENGINE

Suzuo Suzuki, Yokosuka; Kenji Masaki, Yokohama, and Hatuo Nagaishi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Oct. 17, 1977, Ser. No. 843,026
Claims priority, application Japan, Oct. 18, 1976, 51-123856
Int. Cl.[2] F02B *51/04, 33/00*
U.S. Cl. 123—119 E **9 Claims**

1. A fuel supply control system for an internal combustion engine provided with a fuel supply means for introducing a fuel through a fuel passage into an induction passage through which air is admitted, the control system comprising:

two electrodes disposed in the fuel passage with an interval therebetween,

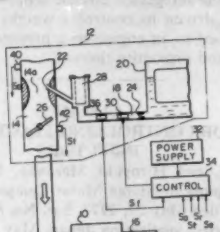
power supply means for applying a DC high voltage to said two electrodes thereby to produce an electric field in the fuel present between said two electrodes;

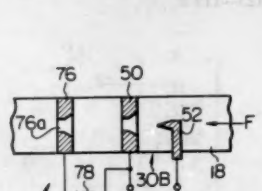
an electronic controller for controlling at least one of the magnitude, polarity and duration of said DC high voltage;

a flow rate detection means for providing an electrical signal representing an actual fuel flow rate in the fuel passage detected in a section at a distance from said two electrodes; and

at least one sensor means each for sensing a variable related to the operating condition of the engine and providing an electrical signal representing the sensed variable;

said controller being so constructed as to establish an optimum fuel flow rate in the fuel passage through the control of said DC high voltage based on the signals provided by said at least one sensor means and cancel any deviation of an actual fuel flow rate represented by the electrical signal provided by said flow rate detection means from said





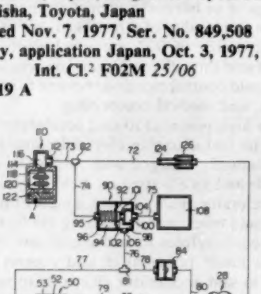
optimum fuel flow rate through corrective control of said DC high voltage.

4,150,648

EXHAUST GAS RECIRCULATION ENGINE FOR HIGH ALTITUDE USE

Tamotu Ogita, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 7, 1977, Ser. No. 849,508
Claims priority, application Japan, Oct. 3, 1977, 52-17952
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An exhaust gas recirculation engine for high altitude use which is provided with an exhaust gas recirculation control valve means for communicating the intake system of said engine with the exhaust system of said engine for recirculating a part of the exhaust gas extracted from said exhaust system into said intake system, the actuation of said exhaust gas recirculation control valve means is controlled by vacuum which is supplied from a vacuum port disposed at a position adjacent to a throttle valve of said intake system, wherein said exhaust gas recirculation engine further comprises:

a reservoir means communicated with a first vacuum supply means for storing vacuum supplied from said first vacuum supply means;

a control valve means communicated with both said reservoir means and said exhaust gas recirculation control valve means for controlling the delivery of the vacuum from said reservoir means to said exhaust gas recirculation control valve means; and

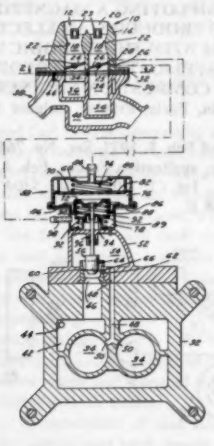
an altitude compensating means for actuating said control valve means in accordance with altitude, whereby when said exhaust gas recirculation control valve means is closed due to a drop in the vacuum supplied from said vacuum port, which drop being caused by the opening operation of said throttle valve at high altitudes, said exhaust gas recirculation control valve means is supplied the stored vacuum from said reservoir means and said valve means is closed after a predetermined delay time.

4,150,649

LOAD RESPONSIVE EGR VALVE

Karl H. Gropp, Grosse Pointe Woods, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1977, Ser. No. 865,034
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**



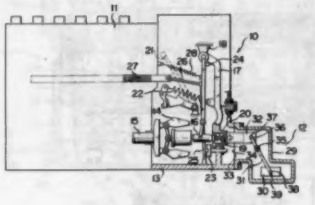
1. An engine exhaust gas recirculating (EGR) valve assembly for an internal combustion engine having a carburetor mounted thereon with an induction passage connected to the intake manifold at one end, a throttle valve, a port opening into the passage at a location to be traversed by the edge of the throttle valve as it moves from a closed to an open position to provide a ported vacuum level changing as a function of the position of the throttle valve, comprising in combination, a duct connecting engine exhaust gases to the engine intake manifold, an EGR valve movable into and out of the duct to block or permit flow of gases through the duct, and control means to control movement of the EGR valve including a spring for opening the EGR valve, the EGR valve being movable to a closed position by manifold vacuum applied thereto, force means urging the EGR valve to a closed position against the action of the spring, and other means operated by ported vacuum for rendering the force means ineffective to move the EGR valve whereby thereafter the EGR valve will be moved between open and closed position solely as a function of the spring force and manifold vacuum level.

4,150,650

INTERNAL-COMBUSTION ENGINE GOVERNOR WITH MEANS TO PREVENT UNNECESSARY CHANGES IN ENGINE SPEED DUE TO INERTIA OR GRAVITY

Yuzo Tsumura, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 804,071
Claims priority, application Japan, Jun. 4, 1976, 51-64640
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 R **4 Claims**



1. In a centrifugal governor for automatically controlling the rate at which fuel is delivered by a fuel injection pump, wherein the governor includes a housing, a fuel metering member adapted to be inserted in the fuel injection pump, and a tension lever pivotally connected to said housing at the top end thereof, said fuel metering member and said tension lever being adapted to be displaced relative to said housing in predetermined opposite directions by inertia or by gravity to cause changes in the rate of fuel delivery by the fuel injection pump, the improvement comprising a counterbalance means for displacement in said predetermined opposite directions by inertia or by gravity, and connector means operatively connecting said counterbalance means to said tension lever such that said counterbalance means acts against said tension lever when they are displaced in either of said predetermined opposite directions, whereby changes in the rate of fuel delivery by the fuel injection pump as a result of inertia or gravity are prevented.

4,150,651

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

James A. Wade, Columbus, and Edward D. Smith, Greensburg, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 29, 1977, Ser. No. 865,463
Int. Cl.[2] F02M *63/02*
U.S. Cl. 123—140 FG **13 Claims**

1. In a fuel system for a multicylinder compression ignition engine, said fuel system comprising

a plurality of fuel injectors, one for each cylinder of said engine, said fuel injectors being adapted to inject fuel in timed sequence in quantities that vary as direct functions of pressure applied to the injectors,

fuel pressurizing means for pressurizing a source of fuel to varying pressure levels as a function of operator demand and engine operating parameters,

passageway means for connecting the output of said fuel pressurizing means to said fuel injectors,

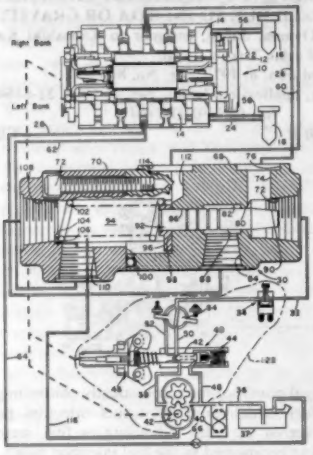
the improvement comprising a valve means interposed in said passageway means, said valve means comprising:

a housing having an inlet connected to said fuel pressurizing means and a flow path leading from said inlet to the passageway means supplying pressurized fuel to a portion only of the fuel injectors for said engine,

a plunger displaceable between a first position wherein it blocks flow through said flow path and a second position wherein said plunger presents a negligible resistance to flow therethrough, said plunger providing a controlled rate of flow area increase between said first and second positions,

means for urging said plunger toward said first position whenever the fuel system is below a predetermined level

and for urging said valve toward said second position whenever the pressure is above said predetermined level,



whereby a portion of the cylinders of said engine are motored during certain operating conditions to minimize engine exhaust emissions.

4,150,652

CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

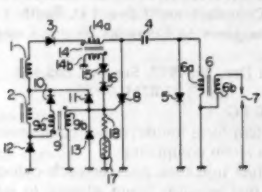
Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 3, 1975, Ser. No. 637,185

Claims priority, application Japan, Dec. 9, 1974, 49-141928; Jan. 27, 1975, 50-12183; Mar. 5, 1975, 50-27492; Jan. 27, 1975, 50-12183

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—148 CC **20 Claims**



1. A contactless ignition system for an internal combustion engine comprising:

capacitor charging coils connected to a magneto generator driven by an internal combustion engine for generating alternating current in synchronism with rotation of said internal combustion engine, said alternating current having positive and negative half waves;

a capacitor connected in series with said capacitor charging coils for storing said positive half waves;

an ignition coil having a primary winding connected in series with said capacitor and a secondary winding;

a spark plug connected to said secondary winding and mounted in said internal combustion engine;

a switching element having a control gate and connected to said capacitor, said switching element, said capacitor and said primary winding forming a capacitor discharging circuit;

a timing signal generating circuit having an input terminal and an output terminal;

said input terminal being connected to said capacitor charging coils so that said negative half wave is supplied to said timing signal generating circuit to generate a timing signal at said output terminal for each of said negative half waves;

said output terminal being connected to said control gate of said switching element, whereby when said timing signal is supplied thereto the stored charge of said positive half waves on said capacitor is discharged through said capacitor discharging circuit to produce an ignition spark at said spark plug; and

a timing signal control circuit including a transformer having a primary coil and a secondary coil, said primary coil being connected to said capacitor charging coils to produce at said secondary coil an output signal in a period overlapping that of said timing signal in proportion to said alternating current, said secondary coil being connected to said timing signal generating circuit through a Zener diode to supply said output signal at said secondary coil thereto while said timing signal is supplied to control gate of said switching element, so that said timing signal is modulated by the output signal of said timing signal control circuit to smoothly vary the output of said timing signal generator when said output signal exceeds a predetermined value which depends on the Zener voltage of said Zener diode, whereby the ignition timing of said ignition spark is appropriately controlled by the modulated timing signal of said timing signal generating circuit.

4,150,653

SYSTEM EMPLOYING A MAGNETOSENSITIVE ELEMENT FOR PRODUCING AN ELECTRIC SIGNAL IN SYNCHRONISM WITH THE PERIODIC MOVEMENT OF A PART AND APPLICATION THEREOF IN INTERNAL COMBUSTION ENGINES

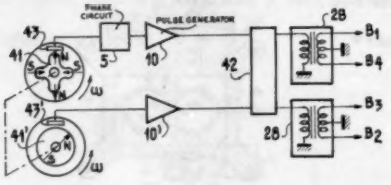
Bernard Grancoin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,546

Claims priority, application France, Feb. 4, 1976, 76 03111

Int. Cl.[2] F02P *1/00, 5/04*

U.S. Cl. 123—148 E **17 Claims**



1. A system in an internal combustion engine for producing an electric signal in synchronism with the periodic movement of an engine part, said signal being subjected to a variable phase shift and controlling a cyclic operation of said engine, comprising:

a permanently magnetized, moving rotor part rotated with said part and oriented in a radial plane;

a soft magnetic alloy stator part in the vicinity of the rotor part;

a magnetosensitive element fixed to the stator part and located between said stator part and said rotor part, said element being of the type having an output signal whose amplitude is independent of the speed of phase shift variation, the form of said rotor part and its movement producing a substantially sinusoidal variation of the magnetic field so that said element delivers a substantially sinusoidal electric signal whose frequency is proportional to the frequency of rotation;

a phase correcting circuit for processing said signal to produce a phase corrected signal, said phase correcting circuit comprising an induction loop subjected to the varia-

tions of the magnetic field, said loop being associated with the magneto-sensitive element and producing a phase shift of the signal which varies with the speed of movement; and

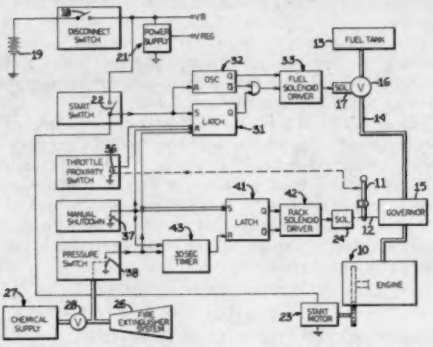
a shaping circuit for delivering from said phase corrected signal a pulse in response to the passage of said corrected signal through a given amplitude.

4,150,654

ENGINE AND FUEL SHUTDOWN CONTROL

Gary N. Heitzman, Washington; Clay L. Hutchings, Pekin; Gary L. Knepp, Eureka; Robert G. Miller, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 11, 1977, Ser. No. 823,770
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—179 L **37 Claims**



1. In an engine and fuel system comprising an engine, a fuel tank, a fuel governor, a fuel rack for controlling the flow of fuel through said governor, a manually operable throttle operatively associated with said fuel rack for moving said fuel rack between fuel-off and full-fuel-on positions, a normally closed fuel valve, a fuel line from said fuel tank through said fuel valve and through said governor to said engine, a starting system for starting said engine, and a start switch for actuating said starting system when said start switch is in start position, the improvement comprising:

a source of electrical energy,

a solenoid operatively associated with said fuel valve for opening said valve when said solenoid is energized,

a settable and resettable latch means,

means responsive to movement of said start switch to its start position for setting said latch means,

means operatively associated with said latch means for connecting said fuel valve solenoid to said source of electrical current for energization of said fuel valve solenoid during the time said latch means is set, and for disconnecting said fuel valve solenoid from said source when said latch means is reset,

a solenoid operatively associated with said fuel rack for moving said fuel rack to fuel-off position when said solenoid is energized,

a timer means having a predetermined period of operation,

means operatively associated with said timer means for connecting said fuel rack solenoid to said source of electrical energy during operation of said timer means and for disconnecting said fuel rack solenoid from said source of electrical energy at the end of the period of operation thereof,

a switch means having an operative position,

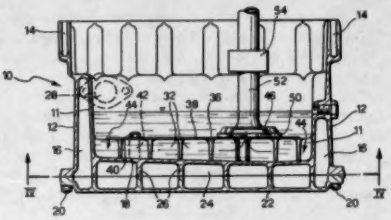
means responsive to movement of said switch means to its operative position for resetting said latch means and for starting said timer means into operation.

4,150,655

LUBRICATING OIL SUMP FOR INTERNAL COMBUSTION ENGINES

Nicola Gaggiano, and Giorgio Forlai, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Oct. 12, 1977, Ser. No. 841,419
Claims priority, application Italy, Oct. 13, 1976, 69471 A/76
Int. Cl.[2] F01M *5/00*
U.S. Cl. 123—196 AB **5 Claims**



1. A lubricating oil sump for internal combustion engines of the kind having side walls and a bottom of hollow construction formed with interspaces for the flow of engine coolant to cool oil in the sump by heat exchange, and inlet and outlet ports communicating with said interspaces, wherein the improvement consists in the following characteristics in combination:

(a) means subdividing the interspace of the sump bottom into interconnected chambers defining a meandering flow passage for the engine coolant between the inlet and outlet ports;

(b) fins on the internal surface of the sump bottom, said fins extending longitudinally of the sump;

(c) a plate resting upon said fins, the plate being spaced from the opposite side walls of the sump to define apertures which extend transversely for admitting oil into the bottom of the sump, and

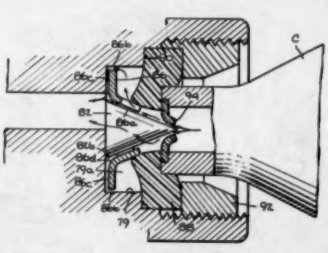
(d) means defining holes in the plate adjacent each of its two longitudinal edges for the passage of oil, and a suction pipe communicating with said holes for withdrawing oil from the sump.

4,150,656

GAS FIRED GUN WITH GAS CARTRIDGE PUNCTURE DEVICE

Roger Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Feb. 4, 1977, Ser. No. 765,555
Int. Cl.[2] F41B *11/06*
U.S. Cl. 124—74 **21 Claims**



1. A gas fired gun comprising:

a gun frame;

a barrel carried by said frame;

means carried by said frame defining a chamber for receiving a gas filled cartridge;

a trigger mechanism carried by said frame;

means responsive to actuation of said trigger mechanism for firing the gun including a valve body having a passage for communicating gas from the cartridge to the barrel and a bore opening into one end of said chamber, a valve member within said body normally sealing said passage, and a piercing member carried by said valve body in said bore adjacent the end of said chamber for piercing the end of the cartridge;

a retainer engageable with said piercing member in said bore;

a seal in said bore encompassing said piercing member for sealing about the pierced end of the cartridge; and

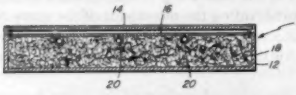
an element coupled to said valve body for retaining said seal within said bore with said seal engaging said retainer to retain it and said piercing member in said bore, said retainer including means for spacing the retainer from the piercing member thereby to define and control the width of a gas flow path past said retainer and to retard flow of dirt particles from the cartridge into the valve body passage between said retainer and said piercing member.

4,150,657

SOLAR COLLECTOR

Robert F. Bowen, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 21, 1977, Ser. No. 853,375
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



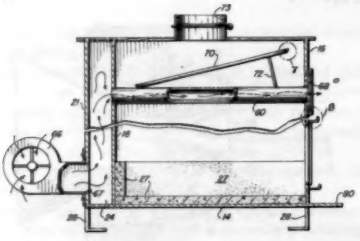
1. A solar energy collector comprising an open-topped receptacle, a panel in said receptacle positioned to be contacted by solar radiation entering the receptacle, at least one integral fluid conduit on said panel, said fluid conduit comprising a groove recessed within the panel and having a substantially annular cross-sectional configuration with a seam at the open side thereof, a weld closing said seam, and means for connecting said conduit to a source of circulating fluid.

4,150,658

CIRCULATING-AIR HEATING STOVE

Lee Woods, Flagstaff, Ariz., assignor to Arizona Forest Supply, Inc., Flagstaff, Ariz.

Filed Mar. 30, 1977, Ser. No. 782,631
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—63 **9 Claims**



1. A free-standing heating stove including in combination:

a combustion chamber with front, back, top, bottom and side walls, said back wall being spaced inwardly from the ends of said bottom, top and side walls;

an auxiliary wall spaced from said back wall and attached to said top, bottom and side walls to provide an airspace between said back wall and said auxiliary wall for passage of air to be heated, an inlet near the bottom of said airspace for the entry of air into such airspace;

a plurality of heat tubes extending across the upper portion of said combustion chamber between corresponding openings in said back wall and front wall to provide passages for air from said airspace to exit from the openings in said front wall;

a baffle plate located above said plurality of heat tubes and inclined upwardly at an acute angle less than 15 degrees therefrom to increase the turbulence of combustion products from the combustion chamber as these products rise therefrom, said baffle plate overlying the major cross-sectional area of said stove over said heat tubes and being spaced from said front, back and side walls of said combustion chamber;

a flue located in said top wall substantially centered above said baffle for forming an outlet for the products of combustion;

said front wall having a rectangular opening in it located beneath the openings terminating said heat tubes and extending substantially from side to side for permitting viewing of a fire therein, if desired; and

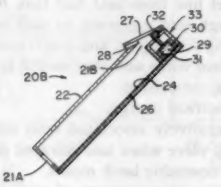
first and second doors pivotally attached on opposite sides of the rectangular opening in said front wall for cooperatively closing said rectangular opening in a closed position and for pivoting back substantially parallel to opposite side walls of said heating stove in an open position to permit use of said heating stove as a fireplace with said doors in the open position and as a heating stove with said doors in a closed position.

4,150,659

APPARATUS FOR PREVENTING HIGH TEMPERATURES IN A GLAZED SOLAR COLLECTOR

Bruce S. Buckley, 410 Memorial Dr., #154, Cambridge, Mass. 02139

Filed Apr. 1, 1977, Ser. No. 783,763
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **4 Claims**



1. Solar energy collecting apparatus, comprising

a solar energy absorber providing an absorbing surface,

glazing means spaced from said surface by an air space,

framing means supporting said absorber and said glazing means in their said spaced relation and including at least one wall transverse to said surface at a first end of said apparatus, said wall having a vent through which said air space can communicate with the exterior of said apparatus at said first end,

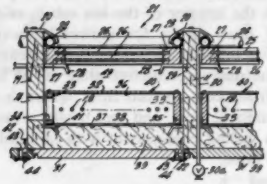
a damper at a second end of said apparatus opposite said wall, said damper being movable between a first position allowing communication between said air space and the exterior of said apparatus at said second end and a second position sealed against said glazing to prevent said communication at said second end,

means for undergoing thermally produced dimensional change in direct response to changing temperature conditions at said apparatus to move said damper between said positions to allow air flow through said apparatus between said ends when said temperature exceeds a limit.

4,150,660
EASY ACCESS ENERGY CONVERSION PANELS FOR SOLAR HEATING SYSTEMS

Melville F. Peters, Livingston, N.J., and Walter T. Peters, East Dennis, Mass., assignors to Margot Elizabeth Peters, East Dennis, Mass. and Albert F. Kronman, Locust Valley, N.Y.

Filed Sep. 15, 1977, Ser. No. 833,464
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 8 Claims

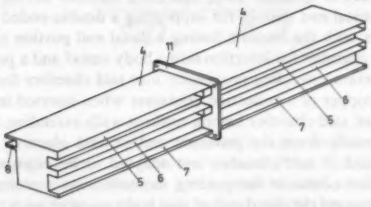


1. A solar energy conversion panel for use in a solar heating system incorporated into a building roof structure having a plurality of spaced rafters therein comprising at least one elongated light transmitting plate supported at its edges and disposed across and between adjacent rafters near the tops thereof, an elongated flanged strip disposed upon the rafters and overlying the edges of the light transmitting plate, an elastomeric gasket held by the flanged strip in fluid-tight contact with the edges of the said plate a bottom plate carried by the said adjacent rafters to enclose with the light transmitting plate and the rafters a chamber, an opening in each of the rafters adjacent at least one end thereof in communication with the chamber, an enclosed duct within the chamber, to receive a fluid, comprising an elongated rigid, bottom member, spaced upstanding supports on said bottom member and a solar energy absorber disposed across and carried by the upstanding supports, openings in the supports in register with the adjacent rafter openings and means to circulate the fluid in the chamber through the solar heating system.

4,150,661
LAYOUT FOR COLLECTING SOLAR ENERGY APPLICABLE TO ACCLIMATIZING ALL TYPES OF BUILDINGS

Marino S. Trimboli Callegari, and Antonio A. Trimboli Longetto, both of concha Espina, 63 - Atico, Madrid, Spain

Filed Apr. 25, 1977, Ser. No. 790,470
Claims priority, application Spain, Feb. 11, 1977, 455.830
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 9 Claims

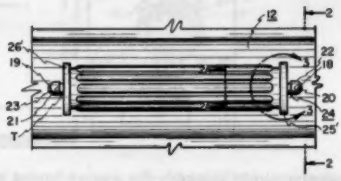


1. A modular unit for heating a building or the like which consists essentially of at least one upper and one lower hollow plates arranged parallel to each other, a fluid placed within the plates, said fluid being suitable to collect solar energy, a common collector for engagement with said plates, means for engaging the plates with said common collector, an air chamber between said plates, a block of insulating material placed under the lower plate, in said collector, a microinsulating sheet between said block of insulating material and said lower plate, said microinsulating sheet being placed with the side facing the lower plate having a reflective surface and means for connecting said module with said building.

4,150,662
SOLAR ENERGY STRUCTURE

Verl R. Summers, 282 S. 200 East, Hyrum, Utah 84319

Filed Jun. 10, 1977, Ser. No. 805,277
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 8 Claims

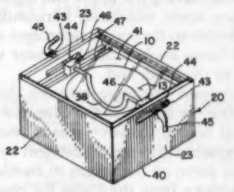


1. In combination, a hollow, elongate heat exchanger having threaded opposite ends, a pair of mutually spaced flanges respectively threadedly disposed on said ends, each of said flanges having annular recesses, said recesses being mutually aligned, and elongate, cylindrically formed lens means extending between said flanges, seated in said grooves, and positioned with respect to said heat exchanger for focusing sunlight onto said heat exchanger.

4,150,663
SOLAR ENERGY COLLECTOR AND CONCENTRATOR

Kenneth J. Sisson, 20 Sunken Meadow Rd., Northport, N.Y. 11768

Filed Aug. 11, 1977, Ser. No. 823,688
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 15 Claims



1. A non-imaging solar energy collection and concentration apparatus, comprising:

a. a housing assembly defining a generally rectangular mounting surface;

b. a concentrator element of hemispherical shape, supported within the housing assembly in rigid relationship thereto, having a concave reflecting surface, with the concave surface faced upwardly;

c. an arcuate fluid-bearing heat collector element, slidably supported upon the housing assembly and over the reflecting surface of the concentrator element;

d. said concentrator element being adapted to reflect incident solar radiation toward an arcuate focal zone; and

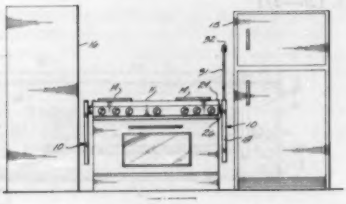
e. said fluid-bearing heat collector element being positioned at the focal zone of solar radiation reflected from the concentrator surface, and operable to accept and absorb the reflected solar rays;

f. said arcuate fluid bearing heat collector element being further disposed within said hemispherical concentrator element, and being substantially parallel with respect to the arcuate portion of the hemispherical-shaped concentrator element.

4,150,664
SPATTER SCREEN FOR STOVE

Edward T. Trombatore, 4139 Whistler Ave., El Monte, Calif. 91732

Continuation of Ser. No. 720,123, Sep. 3, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,678
Int. Cl.[2] F24C *15/12*
U.S. Cl. 126—299 C 2 Claims



1. A spatter screen assembly for a stove having a generally horizontal upper surface with a heater for cooking food, comprising:

a frame;

mounting means secured to the frame and adapted to mount the frame in an upright position alongside the stove upper surface, the mounting means including a support bracket extending laterally from the frame and having a downwardly extending portion configured to hook over and engage the stove to support the upper end of the frame adjacent the stove upper surface, the mounting means further including a bumper secured to and extending laterally from the frame below the support bracket, the bumper being positioned to contact a side surface of the stove to space the frame horizontally from the side surface and to maintain the frame in a stable vertical position;

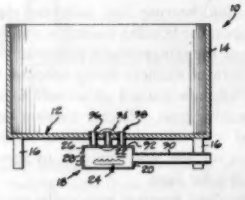
a mesh screen slidably mounted on the frame to be movable between retracted and extended positions, the screen when in the retracted position being disposed within the frame and having an upper end which is generally flush with the stove upper surface, and when in the extended position having the upper end higher than the stove upper surface while remaining horizontally spaced apart from the heater so the screen intercepts material spattered from food being cooked on the heater without preventing access to the food; and

a latch means operative between the screen and frame for holding the screen in the extended position at a predetermined height, the latch means being of a type which can be bypassed without adjustment by exerting an additional lifting force on the screen to enable the screen to be fully withdrawn from the frame for cleaning.

4,150,665
HEATER FOR HOT TUBS AND STORAGE TANKS

Harris P. Wolfson, 225 San Carlos, Sausalito, Calif. 94965

Filed Mar. 4, 1977, Ser. No. 774,270
Int. Cl.[2] F24H *1/28*
U.S. Cl. 126—350 R 14 Claims

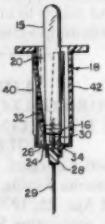


1. In combination with a hot tub useful for bathing and having an unheated floor formed from material subject to damage from excessive heat, a heater comprising means forming a chamber arranged beneath said floor of the tub with a heating element disposed therein, said heater being adapted to provide heat output in a predetermined range, a thermally conductive plate arranged below the level of said floor adjacent the heating element, at least one hollow extension secured to said thermally conductive plate and extending upwardly through an opening in said floor, said hollow extension having a cross-sectional size sufficient to prevent a users contact with said thermally conductive plate and to provide substantial convection circulation of water from the thermally conductive plate throughout the interior of the hot tub in said predetermined range of heat output for uniformly heating water throughout the hot tub interior, said hollow extension serving to insulate the thermally conductive plate of the heating element chamber from said hot tub floor which is subject to damage from excessive heat, and seal means arranged about said extension in sealing engagement with said hollow extension and hot tub floor.

4,150,666
TUBE HOLDER FOR BLOOD COLLECTION TUBES OF DIFFERENT SIZES

Donald C. Brush, Ballwin, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Jun. 27, 1977, Ser. No. 810,256
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 F 12 Claims



1. A tube holder comprising an elongate body member having a chamber for selectively receiving blood collection containers of different sizes, said body member having means at the distal end thereof for supporting a double-ended needle cannula with the cannula having a distal end portion external to said chamber for insertion into a body vessel and a proximal end portion extending proximally into said chamber for piercing a stopper of a collection container when inserted into said chamber, said chamber having resilient walls extending distally substantially from the proximal end of said chamber to the distal end of said chamber and adapted to be engaged by a collection container for guiding the collection container centrally toward the distal end of said body member such that the proximal portion of the needle enters the central portion of the stopper, and size range adjustment means including means for selectively adjusting the position of said resilient walls with respect to the longitudinal axis of said body member, said size range adjustment means including an inclined ramp on each of said resilient walls adjacent the proximal end thereof, and a slide member of fixed dimension slidable from a first position wherein the distal ends of said resilient walls are relatively far apart to a second position on said ramps to bias the distal ends of said resilient walls closer together.

4,150,667

ROTARY FOOT-OPERATED MASSAGING DEVICE

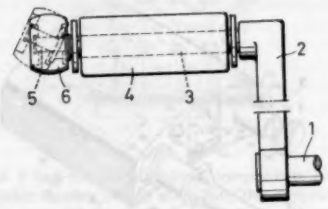
Toshio Takeuchi, 4-15, Takaramachi 3-chome, Kariya-shi, Japan

Filed May 12, 1977, Ser. No. 796,465

Claims priority, application Japan, May 15, 1976, 51-61467[U]; Jun. 19, 1976, 51-80549[U]; Jun. 22, 1976, 51-82496[U]

Int. Cl.[2] A61H 1/02

U.S. Cl. 128—25 B 14 Claims



1. A rotary foot-operated massaging device comprising a horizontal shaft rotatable about its own axis, a pair of cranks each having one end secured to one end of said shaft, a pedal spindle having one end secured to the other end of said each crank at right angles thereto, a pedal rotatably mounted on each of said pedal spindles, massage means supported on at least said each pedal spindle for rotation therewith to intermittantly massage the sole of a foot placed on said each pedal, and said massage means includes eccentric pins fastened to said pedal spindles at the ends remote from said cranks so that said pins rotate around said pedal spindles and roller means overlying said eccentric pins to intermittantly engage the foot when said foot overlies the roller means.

4,150,668

MASSAGE DEVICE

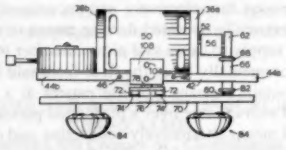
Lyman C. Johnston, 12 Boulton Dr., Toronto, Canada

Continuation of Ser. No. 744,383, Nov. 23, 1976, abandoned. This application May 10, 1978, Ser. No. 904,469

Claims priority, application Canada, Jun. 8, 1976, 254654

Int. Cl.[2] A61H 7/00

U.S. Cl. 128—49 11 Claims



1. A massage device for manipulating body tissue comprising in combination a rigid structure, motor drive means on said structure, a rocking member having ends thereof, elastomeric means pivotally suspending said rocking member on said structure for rocking motion, reciprocating means actuable by said drive means attached to one of said ends to impart a rocking motion to said rocking member, massage elements on said rocking member located about said pivotally suspended elastomeric means, one of said elements being positioned thereon to move in a direction opposite to the direction of motion of another of said elements during rocking motion of said member and gripping means for holding said device secured to said rigid structure at the location of minimum motion of said rigid structure when said device is operative.

4,150,669

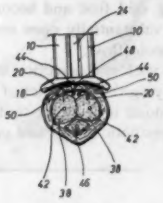
APPARATUS FOR EFFECTING AND ENHANCING AN ERECTION

Alvaro Latorre, 721 Cervantes, El Paso, Tex. 79922

Filed Mar. 16, 1977, Ser. No. 778,048

Int. Cl.[2] A61F 5/00; A61M 5/00

U.S. Cl. 128—79 7 Claims



1. A dual hypodermic needle syringe for injecting fluids into the penis, comprising

two parallel, interconnected barrels, each having an open end and a closed end, each of said closed ends having a passageway therethrough;

two parallel needles extending from said closed ends of said barrels;

two parallel plungers communicating with said barrels;

means for depressing both said plungers; and

a curved end member adjacent said closed ends of said barrels, said end member being for limiting the depth of insertion of said needles, and said curvature approximately conforming to the shape of the penis.

4,150,670

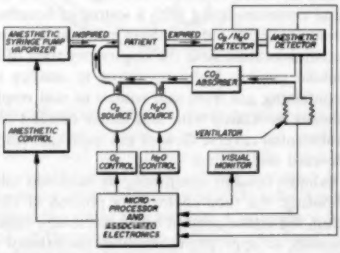
ANESTHESIA DETECTOR AND DISPLAY APPARATUS

Warren R. Jewett; John B. Theiss, and Lawrence Adler, all of Tucson, Ariz., assignors to University Patents, Inc., Norwalk, Conn.

Filed Nov. 14, 1977, Ser. No. 851,141

Int. Cl.[2] A61M 16/00

U.S. Cl. 128—188 11 Claims



10. A closed loop anesthesia administration system comprising:

a closed loop conduit for gaseous flow to and from a patient;

a source of anesthetic gas and means for delivery of known quantities of said gas to said conduit;

a source of oxygen and means for delivery of known quantities of oxygen to said conduit;

means for quantitative detection of anesthetic gas in said conduit and comprising,

a first housing having an inlet and outlet for gaseous flow therethrough,

a membrane of anesthetic gas sensitive elastic material,

means for substantially horizontally and vertically mounting said membrane in said first housing and for substantially supporting said membrane along its entire periphery,

a second housing including electromechanical means for (a) quantitatively detecting mechanical deformation of said membrane in said first housing resulting from reversible swelling in response to the concentration of anesthetic gas in gaseous flow therethrough, and (b) translating detected deformation of said membrane into an electrical signal, and

means mounting said first and second housings in sealed relation with substantially open communication therebetween for gaseous flow,

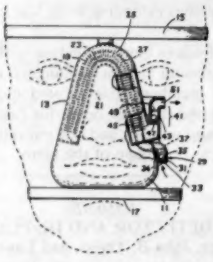
means co-active with said detection means and said delivery means for varying the quantities of oxygen and anesthetic gas to said conduit in response to detected changes in the quantity of anesthetic gas in said conduit.

4,150,671

WARM AIR WEATHERMASK

Howard L. Tiger, Eagle Ridge Way, West Orange, N.J. 07054

Filed Feb. 18, 1977, Ser. No. 770,106
Int. Cl.[2] A61M *15/00*
U.S. Cl. 128—212 **9 Claims**



1. Apparatus for preconditioning air to be breathed by a user of said apparatus, said apparatus comprising in combination:

housing means having a periphery contoured to fit closely against the user's face, an intake conduit defined by an enclosed tube within the housing, the tube having a distal end communicating with a source of breathable, oxygen-containing gas and breathing means at its proximal end for communicating with the respiratory tract of the user, said intake conduit being operative to convey said oxygen-containing gas from said source to said respiratory tract, means associated with said intake conduit for preventing substantial reverse flow of gas from said respiratory tract toward said source,

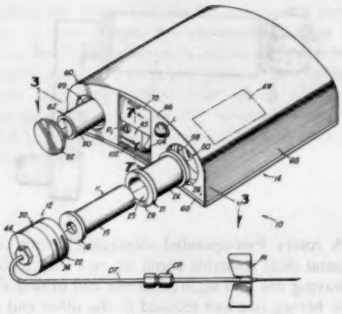
an exhaust conduit comprising an enclosed tube within the housing, the tube enclosing a portion of the intake conduit, the intake conduit being essentially concentric therewithin, an appropriate receiver, the exhaust conduit having a distal end communicating with said appropriate receiver for gases exhausted from said respiratory tract and a proximal end communicating with said breathing means communicating with the respiratory tract of said user, said exhaust conduit being operative to convey said gases exhausted from said respiratory tract to said receiver, and means associated with said exhaust conduit for preventing substantial reverse flow of gas from said receiver toward said respiratory tract, said intake conduit and said exhaust conduit being juxtaposed in indirect heat-exchange relationship wherein said conduits are disposed adjacent said periphery of said housing means to be closely adjacent to the face of the user, thereby improving heat conservation in the system comprising said apparatus and said face, and minimizing loss of heat from said system to the ambient atmosphere.

4,150,672

INJECTION DEVICE AND METHOD

Douglass G. Whitney, 2518 W. Wesley Rd., and John K. Martin, III, 2837 Ridge Wood Cir., both of Atlanta, Ga. 30327

Filed Nov. 12, 1976, Ser. No. 741,528
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **18 Claims**



1. A fluid dispensing device for selectively dispensing a fluid at a controlled slow rate into a patient comprising:

container means defining a fluid chamber therein for containing the fluid to be dispensed and defining a fluid outlet therefrom through which the fluid is to be dispensed into the patient;

expelling means operatively associated with the fluid in said container means to expel the liquid from said container means, said expelling means including a piston member slidably mounted in said fluid chamber for positively forcing the fluid from said fluid outlet as said piston member moves toward said fluid outlet, said piston member moved toward said fluid outlet when said expelling means is driven;

electrically operated driving means for selectively driving said expelling means to force said piston member toward said fluid outlet;

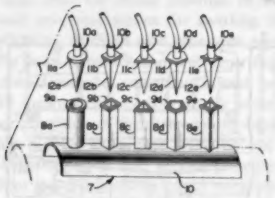
an electrical power supply; and,

control means for selectively and successively connecting said electrically operated driving means to said electrical power supply to cause said piston member to successively and incrementally force the fluid from said fluid outlet in said container means into the patient at a selected prescribed average rate over a prolonged period of time, said control means alternatively connecting said driving means to said electrical power supply for a first prescribed short period of time of fixed duration so that said driving means causes said expelling means to force fluid from said fluid outlet in said container means at a first prescribed rate greater than the selected prescribed average rate and said control means alternatively disconnecting said driving means from said electrical power supply for a second prescribed short period of time to stop the fluid flow from said fluid outlet so that the fluid is forced from said fluid outlet in said container at the selected prescribed average rate over the sum of said first and second periods of time, said control means including adjustment means for selectively varying the duration of only said second prescribed short period of time without varying the duration of said first prescribed period of time to selectively vary the selected prescribed average rate at which the fluid is forced from said fluid outlet of said container into the patient.

4,150,673
CODED ENTRY SYSTEM FOR BLOOD BAG

William E. R. Watt, Barto, Pa., assignor to Pharmachem Corporation, Bethlehem, Pa.

Filed Feb. 3, 1977, Ser. No. 765,295
Int. Cl.[2] A61M *05/14*
U.S. Cl. 128—272 6 Claims



1. In a bag for storing blood components consisting of a sterilizable flexible closed container, the improvement which comprises: an inlet-outlet fitment at the top thereof and forming a part of said closed container so that said container remains sealed after said fitment is attached, said fitment having at least one inlet consisting of a hollow outward protrusion having on its outer diameter a shape-coded configuration, a fluidic connector having a shape-coded configuration corresponding to the shape-coded configuration of said protrusion and being removably and matably sealed in said protrusion; said connector having means for piercing said fitment and said container when inserted in said protrusion, whereby matably sealing said connector with said protrusion causes the piercing means to puncture said fitment and said bag and provide access therein.

4,150,674
THREE-COMPONENT BLENDS OF A POLYAMIDE, AND A POLYESTER AND A LACTAM TERPOLYMER

Kai-Lim W. Yung, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,881
Int. Cl.[2] C08L *77/00*
U.S. Cl. 428—288 11 Claims

1. A method for producing compatible melt blended fibers including a polyester and a polyamide which method comprises adding to the polyester and the polyamide, a terpolymer of lactam-polyol-polyacyl lactam or lactam-polyolacyl polylactam, in which three-component polymeric system each component is present at from 5 to 90% by weight, the process comprising melt spinning the said three component melt blend.

4,150,675
OSTEOTOME AND A METHOD OF SURGICALLY USING SAME

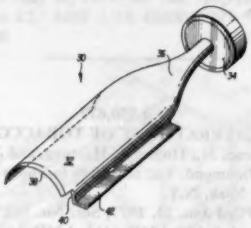
John E. Comparetto, 108 Cropper St., Chincoteague, Va. 23336

Filed Jan. 28, 1977, Ser. No. 763,623
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 10 Claims

1. An elongated osteotome capable of surgically cutting bones, comprising:

cutting blade means at one end thereof including means for retaining said cutting blade means aligned relative to an initial distinct cut of said bone at a first position while said cutting blade means is repositioned to a second position so as to perform a second, distinct cut of said bone;

said aligning means comprising an axially elongated portion of said cutting blade means which is arcuate in cross-sectional configuration and which extends to an edge of said cutting blade, at least part of said elongated portion remaining within said initial cut when said second cut is performed; means for permitting said cutting blade means to be rotatably repositioned along said bone, relative to said initial cut, to form said second distinct cut at said second position while maintaining said elongated portion within said initial cut, said cutting blade means including a cutting portion extending outwardly from said arcuate portion;

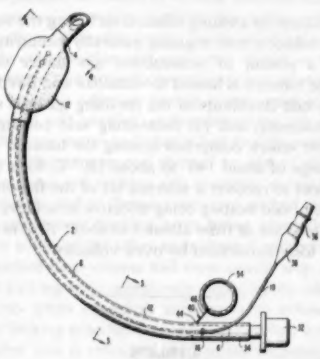


whereby said two distinct cuts of said bone will be accurately aligned relative to each other.

4,150,676
ENDOTRACHEAL TUBES WITH INTUBATION DIRECTION CONTROL MEANS

Isaac S. Jackson, Greenwich, N.Y., assignor to National Catheter Corp., Argyle, N.Y.

Filed Jul. 1, 1975, Ser. No. 592,226
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—351 2 Claims



1. In an endotracheal tube made of water-proof plastic material having a distal end portion, a proximal end portion, a normally curved central body portion integrally joining the distal end portion to the proximal end portion, a primary lumen comprising the major cross-sectional area of the tube, a balloon cuff carried upon the distal end portion, a secondary lumen within the wall of the tube and an inflation tube fixed to the proximal end of said secondary lumen for introduction of fluid therein, said secondary lumen discharging near its distal end into said balloon cuff for inflation thereof, the improvement which consists of intubation direction control means which comprises:

a tertiary lumen within the wall of said tube that extends along the inside of the curve in said central body portion,

an opening into said tertiary lumen through the wall of said tube in the proximal end portion of said tube,

a filament extending through said opening into and along said tertiary lumen to the distal end thereof,

a weldment fixing the distal end of said filament to the distal end of said tube, said filament being knotted at said weldment, and

pull means on the proximal end of said filament external of said tube,

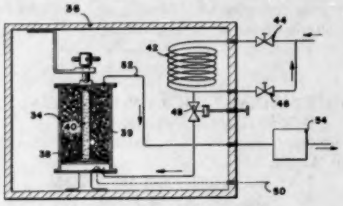
said filament being moveable in said tertiary lumen relative to said tube along its entire length proximal of said weldment thereby tension applied to said filament may produce bending of said tube greater than said normally curved condition.

4,150,677

TREATMENT OF TOBACCO

J. Scott Osborne, Jr.; Homer A. Hartung, and Joseph F. Bebbs, Jr., all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,732
Int. Cl.[2] A24B *3/12;* A24D *1/00*
U.S. Cl. 131—8 R 6 Claims



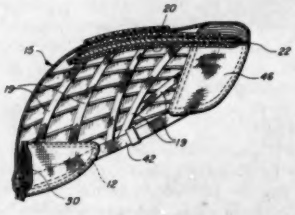
1. In a process for treating tobacco including the steps of (1) contacting tobacco that contains naturally occurring flavorants with a stream of nonreactive gas under conditions whereby the tobacco is heated to volatilize said flavorants, (2) condensing said flavorants of the resulting gaseous stream to form a condensate, and (3) recovering said condensate, the improvement which comprises heating the tobacco in a temperature range of about 140° to about 180° C. for a period of time sufficient to recover a selected set of the flavorants contained therein, said heating being effective to achieve a weight loss of the tobacco of from about 3 to about 10% in excess of the weight loss represented by oven volatiles.

4,150,678

CUSHIONED RETAINER PADS FOR WIGS

Georgia M. Photopulos, 2727 W. Farragut Ave., Chicago, Ill. 60625

Filed Feb. 23, 1978, Ser. No. 880,421
Int. Cl.[2] A41G *3/00*
U.S. Cl. 132—53 5 Claims



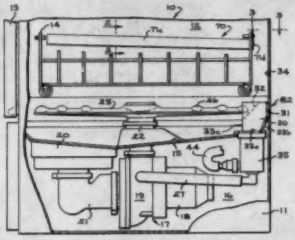
1. A pad means comprising layers of soft material positioned one on top of the other enclosed in a friction-adhering sheathing means to create a pad for a wig whereby when said pad is secured to the under side of a wig, it prevents shifting of the same on the head and irritation to the scalp by conforming to the natural contour of the head.

4,150,679

DISHWASHER WITH IMPROVED BYPASS FILTER ARRANGEMENT

Donald S. Cushing, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 23, 1977, Ser. No. 854,308
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—104 6 Claims



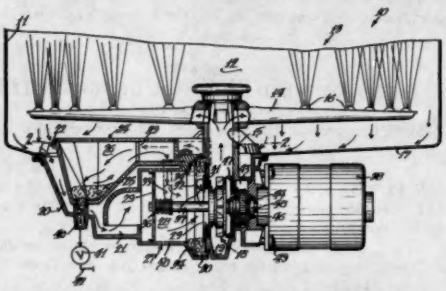
1. In an automatic dishwashing machine having a wash chamber, means for accumulating washing liquid in the lower portion of the chamber and circulating a flow of washing liquid throughout the chamber, soil-removal means independent of the accumulating means and disposed adjacent an inner chamber side in the path of a portion of the recirculating liquid for filtering and collecting soil particles, the soil-removal means including means for effecting drainage thereof at a predetermined time during operation of the machine, the improvement comprising: conduit means independent of said accumulating means and said soil-removing means and disposed in flow path generally upstream of said soil-removal means, said conduit means operative to collect recirculated liquid for distribution to said soil-removing means, whereby liquid which would not normally flow into said soil-removal means is filtered thereby.

4,150,680

DISHWASHER SOIL SEPARATOR

Philip P. Johnson, and Geoffrey L. Dingler, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 26, 1978, Ser. No. 909,778
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—104 7 Claims



1. In a dishwasher having a receptacle defining a dishwashing space, a circulation pump having an inlet and an outlet, means defining a suction passage connecting a lower portion of the receptacle to the inlet of the pump, and means defining a delivery passage connecting the outlet of the pump to an inlet to the dishwashing space wherein dishwashing liquid may be circulated through said dishwashing space for washing dishes therein by removing food particles and soil therefrom, the improvement comprising:

an accumulator defining a settling space portion and a flow conducting portion having an inlet and an outlet;

a separator defining a portion of said suction passage and having an annular outer wall provided with first and second ports connecting with said flow conducting space portion inlet and outlet respectively, said first port being at a greater radial distance from the axis of said annular outer wall than the radial distance of said second port from said axis, and means for swirling the dishwashing liquid flowing through said separator passage portion to urge the food particles and soil centrifugally outwardly toward said annular outer wall, said port, pump, and swirling means being cooperatively arranged to cause a pressure condition of the dishwashing liquid developed at said first port to be higher than the pressure condition thereof developed at said second port thereby causing a portion of the dishwashing liquid being delivered toward said pump in said separator passage portion to be diverted through said first port into said flow conducting space portion of the accumulator to have said food particles and soil in the diverted portion of the dishwashing liquid settle out therefrom into said settling space portion and the cleansed diverted portion to be returned to said separator passage portion through said second port as a result of the pressure differential existing between said ports; and

means for selectively discharging the settled-out food particles and soil from said settling tank.

4,150,681

VISOR MOUNTED WASHER FOR GOGGLES

William F. Howarth, Jr., 8 E. Dracut St., Methuen, Mass. 01844

Filed Apr. 13, 1978, Ser. No. 895,938
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—172 8 Claims

6. Goggle washing apparatus for a racing motorcyclist, said apparatus comprising;

a pressure tank, mounted on the front of the fork of a motorcycle, and having a liquid filler cap, a pneumatic inlet valve and a liquid outlet nipple;

a duck bill visor, worn by the motorcyclist, and projecting forwardly from his head to a substantial distance in front of, and above his goggles;

cleaning liquid delivery means on said visor, including a jet spray nozzle in the forward portion thereof adapted to direct liquid on the lenses of said goggles and including a liquid inlet nipple;

an elongated flexible tube connecting the outlet nipple of said tank to the inlet nipple of said liquid delivery means; and

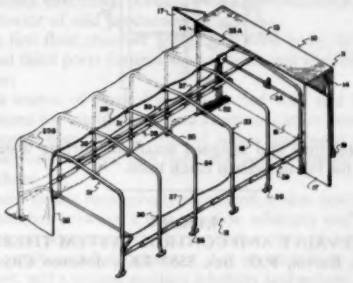
valve means intermediate of the length of said tube for selectively controlling the application of pressurized cleaning liquid from said tank onto the lenses of said goggles.

4,150,682

EXTENDABLE, RETRACTABLE AND PORTABLE SHELTER

Anne Ryce, 5D-1975 Corydon Ave., Winnipeg, Canada

Filed May 18, 1977, Ser. No. 797,913
Int. Cl.[2] A45F *1/16*; E04B *1/347*
U.S. Cl. 135—4 R 8 Claims



1. An extendable and retractable shelter assembly for automobiles and the like comprising in combination an enclosure, and a shelter unit selectively situated therein, said shelter unit including a plurality of arched components, said arched components including an innermost component and an outermost component, each of said arched components including a pair of spaced and parallel substantially vertical portions and an over-spanning portion extending between the upper ends of said vertical portions, a flexible cover, means securing one end of said flexible cover within said enclosure, means securing said flexible cover to said arched components and releasable locking means between adjacent arched components to maintain some in spaced and parallel relationship when extended, said releasable locking means including a first locking arm pivotally secured by adjacent one end thereof to one of said arched components, a second locking arm pivotally secured by adjacent one end thereof to the next adjacent arched component, said first and second locking arms being pivotally secured together by adjacent the other ends thereof and between said adjacent arched components and over-center stop means on one of said locking arms operatively engaging the other of said locking arms when extended, and means to release successively, said locking arms between adjacent arched components as said shelter unit is retracted, said means including a lower lug extending from said one end thereof of one of said locking arms pivotally secured to one of said arched components and an upper lug extending from said one end of the other of said locking arms pivotally secured to the same said one arched component, said upper lug operatively engaging said lower lug as said shelter unit is retracted thereby raising said other end of said one locking arm.

4,150,683

ELIMINATION OF OVERFLOW OF SEWER SYSTEMS

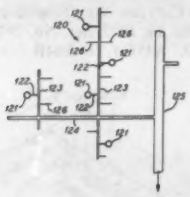
Wilbur Simon, 164 Division St. P.O. Box 58, Elgin, Ill. 60120

Filed Aug. 22, 1977, Ser. No. 826,765
Int. Cl.[2] E03F *3/00*
U.S. Cl. 137—1 12 Claims

1. A process for preventing overflow and sewage back-up by surface water in a combined sewer system having a plurality of catch basins comprising the steps of:

(A) assigning a maximum surface water flow rate from each catch basin in such combined sewer system, and

(B) adjusting the effective maximum flow rate of surface water through each catch basin to a value which is not



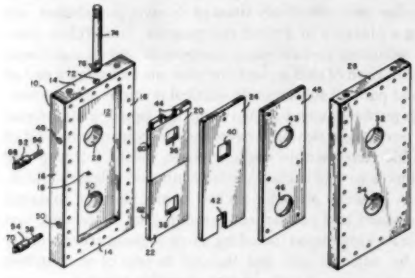
greater than said assigned maximum surface water flow rate for the individual catch basin.

4,150,684

MIXING VALVE AND CONTROL SYSTEM THEREFOR

Willis D. Kervin, P.O. Box 5357 EKS, Johnson City, Tenn. 37601

Filed Jan. 25, 1977, Ser. No. 762,275
Int. Cl.[2] G05D *11/03*
U.S. Cl. 137—111 **24 Claims**



1. A mixing valve comprising a rigid body containing a recess and inlet and outlet ports in connection therewith corresponding in number to the number of fluids to be mixed, proportioning means in the recess corresponding in number to the inlet ports, movable in a common plane relative to each other and to the inlet ports, said proportioning means defining openings so arranged with respect to the inlet ports that movement of the proportioning means relative thereto and each other changes the ratio of the fluids passing through them, and single flow control means in said recess situated between the proportioning means and the outlet ports, movable in a plane parallel to the plane of movement of the proportioning means and relative thereto in a direction at right angles to the movement of the proportioning means, defining openings corresponding in number to the outlet ports so arranged relative to the openings in the proportioning means that movement thereof relative to the proportioning means changes the total flow through the discharge ports without changing the ratio of the mixture.

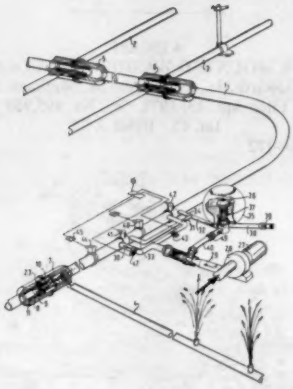
19. In combination with a mixing valve according to claim **1**, conductor means for delivering the fluids to be mixed to the mixing valve, pneumatically operable means for controlling the flow of fluids to be mixed through the conductor means to the mixing valve, a control circuit for supplying operating pressure to said pneumatically operable means to effect their operation, a starting circuit for supplying operating pressure to said control circuit comprising a first relay, means connecting the inlet of said first relay to one of the conductor means, a second relay, means connecting the inlet of the second relay to the outlet of the first relay and means connecting the outlet of the second relay to the circuit, a normally open valve set to close at at predetermined set pressure connected to each of the relays to shift the latter from closed to open positions to permit pressure from said conductor means to flow to said control circuit, means connecting one of the normally open valve means to each of the conductor means, a needle valve for limiting the flow of pressure to each of the normally open valves to less than that required to close the normally open valve means so that as long as the pressure at said normally open valve means is less than said predetermined pressure, the normally open valves remain open and a normally open push-button exhaust valve through which the pressure bleeding through the normally open valve flows to the atmosphere, said normally open exhaust valve being operable to block the escaping pressure from the normally open valve means and to close the normally open valves if the pressure at said normally open valves rises to said predetermined set pressure, said relays being operable by the pressure at said normally open valve means when the latter are closed to shift to their open positions and being operable if the pressure at either of said normally open valve means falls below said set pressure to exhaust the pressure.

4,150,685

LIQUID DISTRIBUTION DEVICE

Henry M. T. Van Haaften, Aquamarijnstraat 793, Groningen, Netherlands

Filed Jun. 24, 1977, Ser. No. 809,658
Int. Cl.[2] B05B *1/00*
U.S. Cl. 137—119 **22 Claims**



1. A distribution device for a liquid, particularly water, comprising a main conduit communicating with a plurality of outlet members each of which has a normally closed valve associated therewith, and a body adapted to move through the main conduit for opening said valves in sequence, each for a predetermined period of time depending upon the retention time of the body at each valve, characterized in that the body includes means for the optional adjustment of said retention time of the body at each valve.

4,150,686

ELECTROHYDRAULIC CONTROL MODULE

Fouad El Sherif, Valencia, and Harry J. Svoboda, Granada Hills, both of Calif., assignors to Textron Inc., Providence, R.I.

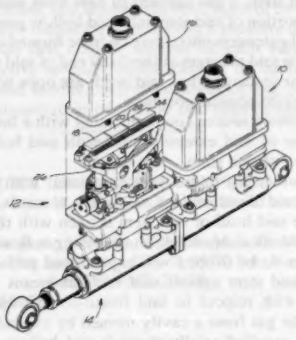
Filed Nov. 15, 1976, Ser. No. 742,291
Int. Cl.[2] F15B *13/043*
U.S. Cl. 137—377 **8 Claims**

1. Modular electrohydraulic control apparatus for removable connection to a structure to be controlled comprising:

(A) a unitary housing member;

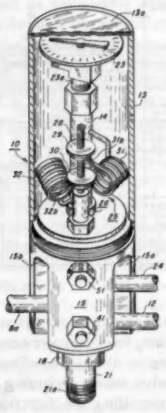
(B) at least one electrohydraulic servo-valve member component affixed to said unitary housing member;

(C) said housing member defining a plurality of bores therein each extending from one side only of said housing;
(D) cover plate means removably secured to said housing to sealingly cover said bores;
(E) at least one hydraulically actuated slide valve member component slidably disposed within each of said plurality of bores;
(F) a plurality of fluid passageways defined within said housing member for interconnecting each of said components received within said housing to selected ones of other of said components;



(G) said housing defining ports therein for receiving pressure and return connections from a source of hydraulic fluid under pressure and for connecting working fluid to said structure to be controlled;
(H) a protective cover;
(I) means sealing said protective cover to said housing member thereby to cover and provide protection for said electrohydraulic servo-valve; and
(J) means for connecting said housing member to said structure to be controlled.

4,150,687
WELL PILOT VALVE ASSEMBLY
James R. Blanton, 2300 Westbrook, Carrollton, Tex. 75006
Filed May 12, 1977, Ser. No. 796,055
Int. Cl.[2] F16K *17/00*
U.S. Cl. 137—458 **13 Claims**

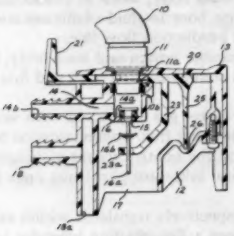


1. In combination with a well head assembly of the type including gate valve means opened and closed to respectively enable and terminate production flow through a flow line connected with said assembly and control means operatively associated with said gate valve means for opening and closing said gate valve means in response to the extent of fluid pressure acting on said control means, a pilot valve assembly for regulating the extent of said fluid pressure acting on said control means in response to the fluid pressure within said production flow line, said pilot valve assembly comprising:
(a) a main body adapted for connection with said production flow line, said main body, when so connected, having an axially extending bore in fluid communication with the interior of said production flow line,
(b) a first fluid chamber within said main body; first, second and third ports communicating with said first fluid chamber;
(c) a source of control gas connected with said first port, means for establishing fluid communication between said second port and the control means associated with said gate valve means, said third port being open to the atmosphere;
(d) seal means respectively translated within said first fluid chamber between a first position whereby said first and second ports are in fluid communication with one another through said fluid chamber, but isolated from said third port, and a second position whereby said second and third ports are in fluid communication with one another through said first fluid chamber, but isolated from said first port;
(e) a trip valve assembly main housing defining a second fluid chamber therein, a second axially extending bore establishing fluid communication between said first and second fluid chambers; and
(f) tripping means for automatically translating said seal means from said first position to said second position in response to the fluid pressure within said production flow line being above or below a predetermined operating range, said tripping means comprising:
(i) first and second bourdon tubes respectively expanding and contracting in response to increases and decreases of said production flow line pressure, and
(ii) translatable means engageable by the respective free ends of said bourdon tubes as a consequence of the increased expansion of the first bourdon tube as well as of the increased contraction of the second bourdon tube, thereby initiating the translation of said seal means from said first position to said second position, said translatable means comprising an elongated stem mounted for axial translation through said second fluid chamber and a pair of thumbwheels adjustably mounted on said stem and positioned immediately adjacent the respective free ends of said first and second bourdon tubes.

4,150,688
REMOVABLE FLUID TAKE-OFF AND PRESSURE RELEASE COUPLING FOR WASHING MACHINE AND THE LIKE
John G. Crawford, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Jan. 3, 1977, Ser. No. 756,234
Int. Cl.[2] B05B *1/22;* **F16K** *24/00*
U.S. Cl. 137—562 **13 Claims**

1. A fluid coupling assembly for connecting fluid utilization apparatus to a tubular fluid supply and shut-off fixture having a latching shoulder, said assembly comprising:
(a) a housing having spaced-apart fluid inlet and outlet ports and defining an unobstructed fluid passage therebetween, said passage having an auxiliary outlet port formed therein;
(b) valve means operative to open and close said auxiliary port;
(c) a slidable detent plate having a longitudinal slot, said slot having an enlarged portion for permitting passage of said latching shoulder for coupling and decoupling said fluid inlet and said fixture, and a narrow portion for engaging said latching shoulder, said detent plate being movable in a direction substantially normal to said latching shoulder;

(d) said detent plate being movable in a first direction from a normally latched operating position, in which said latching shoulder is engaged by said slot and said valve means is closed, to an intermediate position for opening said auxiliary port, said detent plate being further movable in said first direction to a coupling and decoupling position,



in which said latching shoulder is aligned with said enlarged portion of said slot; and

(e) valve actuating means fixed to said detent plate for opening said valve means as said detent plate moves through said intermediate position between said normally latched operating position and said coupling decoupling position.

4,150,689

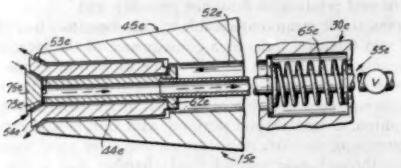
CORE ROD CONSTRUCTION FOR BLOW-MOLDING APPARATUS

George C. Britten, 50 Beech St., Floral Park, N.Y. 11001

Continuation of Ser. No. 327,005, Jan. 26, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,391

Int. Cl.[2] F16K *1/44*; B29C *5/06*

U.S. Cl. 137—595 **4 Claims**



1. A core rod construction, for use with a mold, of a generally elongate and longitudinal configuration for blow-molding apparatus comprising:

an open ended hollow mounted sleeve;

a hollow parison forming extension provided at an outer end of said sleeve, said extension having a hollow passage portion, said extension being in a spaced location from side walls of said mold, said extension having an elongated distal end region of generally frusto-conical configuration, said end region having a hollow passage portion tapering outwardly and forming a substantially axially directed, internally disposed frusto-conical opening at the end thereof;

an elongate tubular stem internally and shiftably disposed longitudinally and concentrically in spaced relation with said sleeve and said extension, an intermediate frusto-conical valve head, having a substantially axially directed, internally disposed frusto-conical opening and a substantially axially directed, externally disposed frusto-conical surface, slideably received on said stem, said externally disposed frusto-conical surface of said intermediate valve head removably sitting in said internally disposed frusto-conical opening at the end of said extension, said stem having a frusto-conical valve head with a substantially axially directed frusto-conical surface at the distal end thereof and being movably received in the internally disposed frusto-conical opening of said intermediate valve head such that when said stem is shifted in a direction opposite from said distal end of said extension, said valve head sits in closing relation with both of said frusto-conical openings, and when said stem is shifted in a direction toward said distal end of said extension, said valve head of said stem opens with respect to said frusto-conical openings and annular spacings through which gases may pass are formed therebetween, said stem having a hollow passage portion and a plurality of radial passages at the distal end thereof closer in than said head, said radial passages enabling communication between said hollow passage portions of said extension and said hollow passage portion of said stem, a gas adapted to pass from said hollow passage portion of said stem into said hollow passage portions of said extension into a parison to be formed on said extension via said passages at the distal end of said stem and said annular spacings when said heads are open with respect to said frusto-conical openings;

a gas pressure source communicating with a hollow passage portion of said extension and with said hollow passage portion of said stem,

a resilient means operatively associated with said stem to urge said distal end of said stem towards the position where said head of said stem is open with respect to said frusto-conical openings, so that the gas flowing into said parison to be formed will expand said parison, means to shift said stem against said resilient means to close said head with respect to said frusto-conical openings, such that the gas from a cavity formed by expanding the parison is expelled axially through said hollow passage portion of said stem, whereby a greater discharge of cooling and blowing air is achieved at the lower or bottom region of said mold.

4,150,690

HYDRAULIC CONTROL ARRANGEMENT FOR AT LEAST TWO HYDRAULIC CONSUMERS

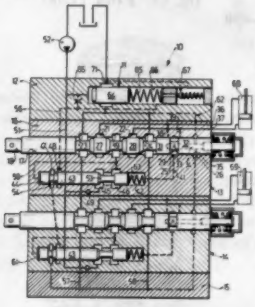
Joachim Heiser, Stuttgart, and Wolfgang Bernhardt, Korntal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1977, Ser. No. 851,755

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701509

Int. Cl.[2] F15B *13/08*

U.S. Cl. 137—596.13 **6 Claims**



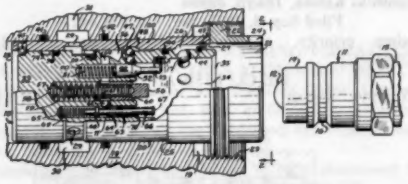
1. A hydraulic control arrangement for at least two hydraulic consumers, comprising two pressure compensated multiple position valve means respectively coordinated with said consumers, each of said valve means including two control members, a first one for controlling the direction of movement of the consumer coordinated therewith and for throttling flow of pressure medium thereto and a second spring biased control member for compensating a pressure difference produced by said first control member during throttling of the flow of said pressure medium therethrough; a source of pressure medium including a pump feeding pressure medium from a tank into an

inlet conduit; a return conduit communicating with said tank; an unloading valve connected in parallel to said two valve means to said inlet conduit and movable between an open position permitting flow of the fluid medium from said inlet conduit directly to said return conduit and a plurality of second positions throttling such flow to an increasing extent; a first control conduit connecting said inlet conduit with said unloading valve and the two valve means and leading from the latter to said return conduit; a throttle in said first control conduit; control means connected to each of said second control members for controlling flow of fluid passing through said first control conduit; and second and third control conduits for each of said valve means for transmitting a pressure difference produced by the first control member of each valve means onto the respective second control member of the respective valve means, said second control members of said two valve means being connected in parallel to said inlet conduit.

4,150,691
QUICK DISCONNECT COUPLING

Ojars Maldavs, Lincoln, Nebr., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 687,001, May 17, 1976, Pat. No. 4,077,433. This application Oct. 7, 1977, Ser. No. 840,302
Int. Cl.² F16L *37/28*
U.S. Cl. 137—614.03 **9 Claims**



1. A quick disconnect female coupling for coaction with a check-valve equipped male coupling, the female coupling comprising:

a generally tubular housing having an axially extending bore open at one end for receipt of said male coupling and a port through the housing communicating with said bore,

a spool slidably mounted in said bore and having a central flow passage and an outwardly extending flow passage extending therethrough communicating with the central flow passage, the spool being movable between a first position in which the outwardly extending flow passage of the spool is sealed from said port in the housing and a second position in which the outwardly extending flow passage of the spool communicates with the port in the housing, and

actuator means mounted in the spool and engageable with the check valve of the male coupling for opening the check valve, the improvement characterized by:

a pin movably mounted on the spool and engageable by the male coupling as the male coupling is inserted into the bore of the housing, the pin being movable between first and second positions by the male coupling,

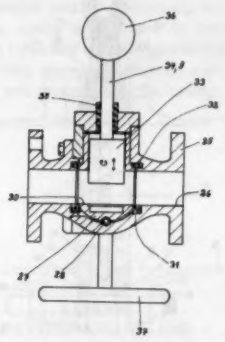
spring means for resiliently biasing the pin toward its first position, and

locking means carried by the spool and cooperable with said pin for maintaining the spool in its first position, the locking means being movable between a locked position in which the spool is locked in its first position and an unlocked position in which the spool can move from its first position to its second position, the locking means being maintained in its locked position by the pin when the pin is in its first position whereby the spool will remain locked in its first position until the male coupling engages the pin and moves the pin from its first to its second position.

4,150,692
VALVE FOR CLOSING, THROTTLING OR REGULATING

Karl J. Wolf, Mannheim, Fed. Rep. of Germany, assignor to Weinheimer Gummiwerke GmbH, Fed. Rep. of Germany

Filed Feb. 8, 1977, Ser. No. 766,665
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606042
Int. Cl.² F16K *11/22*
U.S. Cl. 137—614.17 **11 Claims**



9. A regulating valve comprising:

a housing having a continuous bore therethrough for the passage of a fluid substance;

a ball chick mounted rotatably in said housing, said ball chick having a passage therethrough which may be in alignment with the continuous bore of said housing;

said ball chick further having a cylindrical guide bore;

a control cone mounted in said cylindrical guide bore;

means for moving said control cone both longitudinally and rotatably with respect to said housing and ball chick; said control cone including a hollow cylinder having an opening in a part thereof to form a partial shell, an annular groove provided inside said partial shell near one end thereof, a traverse mounted by the ends thereof in the annular groove, and a guide bar for movement of the control cone affixed to said traverse.

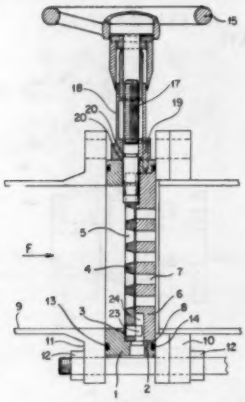
4,150,693
ADJUSTABLE LOSS-OF-HEAD VALVE

Jacques Genevey, Echirolles, and Jean Vincendon, Grenoble, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed May 19, 1977, Ser. No. 798,559
Claims priority, application France, Jun. 14, 1976, 76 17956
Int. Cl.² F16K *3/32*
U.S. Cl. 137—625.3 **1 Claim**

1. An adjustable loss-of-head valve for clamping between two opposed flanges of a pipe, said valve comprising: an annular body of a diameter permitting said body to be clamped between said pipe flanges, an annular recess on the inner periphery and to one side of said annular body and defining a upstream annular constriction and forming a first radial shoulder and wherein said annular recess includes a radially projecting portion on the downstream side of said annular body and forming a second radial shoulder downstream of said first shoulder, a stationary perforated plate having a diameter in excess of the internal diameter of said annular constriction and positioned within said recess and having a radially projecting portion in abutment with said second shoulder such that the upstream end thereof is spaced axially from said first shoulder, a mobile perforated plate having a diameter less than the diameter of the recess but greater than the diameter of the annular constriction, slidably mounted upstream of said stationary perforated plate within said recess between said annular con-

striction and said stationary plate with its peripheral edge facing said first shoulder and means for clamping said annular body between said opposed pipe flanges and said radially projecting portion of said stationary perforated plate against said second shoulder, and control means mounted on said annular body for moving said mobile plate transversely to the axis of said annular body to vary the perforations of one plate



with respect to the other, and wherein said annular recess radially projecting portion on the downstream side of said annular body and forming said second radial shoulder is of a radial depth in excess of the diameter of said radially projecting portion of said stationary perforated plate to define an annular seal ring recess between an opposed pipe flange and said single piece annular body, and an annular seal ring within said annular seal ring recess.

4,150,694

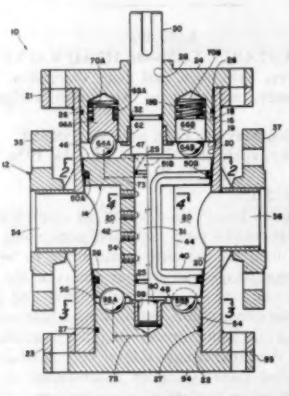
ROTARY PLUG VALVE

Joseph C. Halpine, Tulsa, Okla., assignor to Fluid Measurement Systems, Inc., Tulsa, Okla.

Filed Jul. 27, 1977, Ser. No. 819,357

Int. Cl.[2] **F16K** *39/06*

U.S. Cl. 137—625.47 **5 Claims**



1. A rotary plug valve comprising:

(a) a housing having an axial tapered inner wall forming a tapered inner cavity and a plurality of radial openings at selected angles leading through said tapered wall into said tapered inner cavity;

(b) a rotatable tapered plug adapted to fit said tapered cavity, the plug having a top and bottom surface, and having seal means to seal the outer surface of the plug to said housing inner wall, and the plug having at least one conduit opening therethrough, whereby when said plug is seated in said cavity, liquid entering an opening in said housing will flow through said conduit opening in said plug to another opening in said housing dependent on the angular position of the plug;

(c) top and bottom closure plates affixed to said housing to seal the ends of said housing inner cavity, the top closure plate having an axial opening for sealing a shaft axially connected to said plug;

(d) a cam surface on the plug bottom surface adapted to cooperate with a corresponding cam surface on the bottom closure plate, whereby when said plug is rotated in said cavity, it will be alternately lifted, and depressed by said cam surfaces; and

(e) a cam surface on said top closure adapted to cooperate with a cam surface on the top of said plug, whereby as said plug is rotated about its axis in one direction it will be pressed down by said top plate cam surface, into sealing engagement with the housing inner wall, and lifted up to provide free, low resistance rotation by the bottom plate cam surface when said plug is rotated in the opposite direction.

4,150,695

SOLENOID PILOT OPERATED CHANGE-OVER VALVE

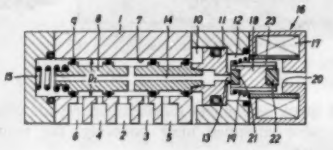
Seiji Kosugui, Soka, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,442

Claims priority, application Japan, Sep. 8, 1976, 51/120850[U]

Int. Cl.[2] **F15B** *13/043*

U.S. Cl. 137—625.64 **1 Claim**



1. A solenoid pilot operated change-over valve comprising, in combination:

a spool casing closed at one end and internally defining a spool chamber, the spool casing being provided along the length thereof with an input port and a number of output and drain ports in communication with said spool chamber;

a spool valve slidably received in said spool chamber and circumferentially having a number of sealing ridges to connect said output ports selectively either with said input port or one of said drain ports;

a fluid passage formed axially through said spool valve in communication with said input port;

a piston chamber provided contiguously to the other open end of said spool casing;

a piston rigidly mounted at one end of said spool disposed at said open end of said spool casing and axially slidable within said piston chamber, said piston having an axial bore communicating at the inner end thereof with said axial fluid passage in said spool and forming at the outer end thereof a pilot valve seat of a suitable effective diameter;

a pilot chamber provided contiguously on the outer side of said piston chamber and having at an outer end thereof a drain valve seat of an effective diameter at least 1.4 times greater than that of said pilot valve seat on said piston;

a plunger accommodated within said pilot chamber and axially movable to open and close said pilot and drain valve seats;

a spring loaded on said plunger for constantly urging the

plunger toward said pilot valve seat, said spring having a combined force and stroke length sufficient to move said plunger into abutment with said pilot valve seat only when said piston is positioned at a first change-over position;

a solenoid device mounted in and around said pilot chamber and actuatable to attract said plunger electromagnetically away from said pilot valve seat against the force of said plunger biasing means and to seat said plunger securely on said drain valve seat, thereby introducing fluid pressure into said pilot chamber for shifting said spool and piston from said first to a second change-over position; and

a return spring mounted at said closed end of said spool casing and acting on the other end of said spool valve to return said spool to the initial position, said return spring and a pressure differential acting upon the opposite ends of the spool valve to retain said spool valve securely in said first and second change-over positions until said solenoid is either activated or deactivated.

4,150,696

ARRANGEMENT FOR SUPPRESSING VIBRATIONS CAUSED BY THE FLOW OF A FLOWABLE MEDIUM

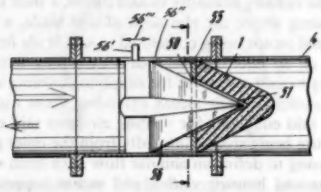
Gerd E. A. Meier, Roringen, and Winfried Hiller, Göttingen-Nikolausberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 502,414, Sep. 3, 1974, abandoned. This application Jul. 26, 1976, Ser. No. 709,165

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1974, 2410231

Int. Cl.[2] F15D *1/02*

U.S. Cl. 138—44 **39 Claims**



1. In a fluid flow-through device, a combination comprising: first means defining a passage for conducting a stream of a fluid medium of a given kinematic viscosity v though the device; second means communicating with said first means and being disposed to impart fluctuations to said stream; and third means for controlling the flow characteristics of the medium to supress fluctuations in the stream, said third means including a first structure arranged within said passage downstream of said second means, said structure being permeable to the fluid medium and defining in its upstream portion a channel converging in the flow direction, a portion of said first structure surrounding said channel having a plurality of pairs of surfaces past which the medium flows at a speed u, said surfaces extending transversely with respect to the direction of flow, the surface in each pair being spaced from each other at a distance d which is determinative of the flow characteristics of the medium, said third means being operative for maintaining the Reynolds number $Re=ud/v$ below 10^3.

4,150,697

TREATMENT OF REGENERATED CELLULOSE CASINGS WITH SURFACE ACTIVATING ENERGY

Arthur M. Dowell, and Henry E. Judd, both of Danville, Ill., assignors to Teepak, Inc., Chicago, Ill.

Filed Mar. 17, 1978, Ser. No. 887,407

Int. Cl.[2] F16L *11/00*; B29F *5/00*

U.S. Cl. 138—118.1 **8 Claims**

1. In the method of manufacturing cellulosic casings suitable for the encasement and processing of sausage meat emulsions, the improvement which comprises exposing the meat contacting surfaces of the casing to a source of surface activating energy to an extent sufficient to induce a change in the surface of the casing whereby the casing shrinks with sausage meat emulsions encased and processed in the casing.

4,150,698

PATTERNING MEANS

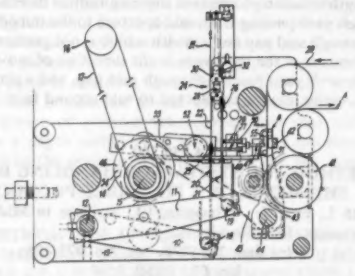
John D. Griffith, Sunderland, England, assignor to Bonas Machine Company Limited, Staffordshire, England

Filed Oct. 17, 1977, Ser. No. 842,913

Claims priority, application United Kingdom, Oct. 16, 1976, 43068/76

Int. Cl.[2] D03C *3/14, 3/32*

U.S. Cl. 139—55.1 **21 Claims**



1. A loom patterning mechanism including:

drive means for performing a loom function, said drive means comprising hook means attached to the ends of a first pulley mounted function control cord, said hook means each being provided with a pin engaging eye and being connected to operating lever means and a lost motion connection to an operating lever;

continuously movable pattern information means;

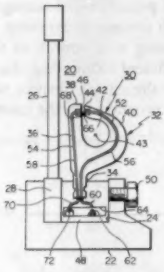
pivotably mounted pattern information sensing means arranged to be movable synchronously with said information means for at least part of a loom cycle;

and control means responsive to said pattern information sensing means and adapted to control said drive means in accordance with the pattern information and in timed relationship with the loom weaving cycle, said control means comprising a pair of engaging pins mounted for movement by said pattern information sensing means selectively to engage said drive means whereby, when one of said engaging pins engages one of said eyes, one end of said cord is retained, and the other end of said cord is movable by the associated operating lever to enable said pulley to be moved bodily to initiate a loom function.

4,150,699
WEFT YARN SENSOR

Junnosuke Suekane, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 14, 1977, Ser. No. 806,509
Claims priority, application Japan, Jun. 17, 1976, 51-70368
Int. Cl.[2] D03D 51/34
U.S. Cl. 139—370.2 11 Claims

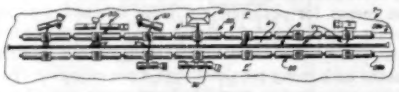


1. A weft yarn sensor for a weaving loom, comprising
a sensor body formed with an aperture through which an inserted weft yarn is passed during insertion, said sensor body having
a first face for projecting light, and
a second face for receiving the light from said first face, said first and second faces confronting each other and defining therebetween a gap providing communication between said aperture and the outside thereof for allowing the weft yarn to pass from said aperture to the outside thereof, said second face having
a length which is elongate in the longitudinal direction of the weft yarn passing from said aperture to the outside thereof through said gap and a width which is not greater than the diameter of the weft yarn in the direction of movement of the weft yarn passing through said gap, and a single light-receiving device connected to said second face.

4,150,700
METHOD AND SYSTEM FOR HANDLING BULK SHIPMENTS OF A FLOWABLE PRODUCT

Kenneth L. Fox, Jr., Winnetka, Ill., assignor to Mid-America Sweeteners, Inc., Skokie, Ill.

Filed Jan. 23, 1978, Ser. No. 871,451
Int. Cl.[2] B65B 3/14
U.S. Cl. 141—11 13 Claims

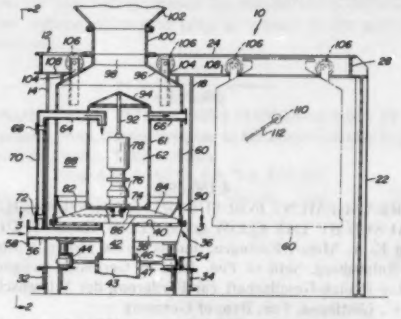


1. A method of transferring within a predetermined time interval by a compressed fluid a selected amount of flowable product from one bulk container to a second bulk container, said one container being provided with a valved product discharge port, a fitting connected to the port and having a compressed fluid first inlet disposed adjacent to but downstream of the valved discharge port, and a compressed fluid second inlet communicating with the interior of said one container, and said second container being provided with a valved product inlet port and adjustable means for relieving pressure buildup within the second container while the product is flowing therein; said method comprising charging the interior of the one container to a predetermined pressure by connecting the second inlet to a source of the compressed fluid; removably connecting a duct section to the fitting and the product inlet port subsequent to the valves of said ports being adjusted to closed positions; adjusting the port valves to fully open positions after the duct section is in place; adjusting the pressure relief means of the second container to a pressure relief position; adjusting the valved product discharge port to a closed position after the predetermined time interval has elapsed; connecting the fitting first inlet to the source of compressed fluid and purging the duct section of flowable product; adjusting the valved product inlet port of the second container to a closed position subsequent to the duct section being purged of the flowable product; and disconnecting the duct section from at least the port of one of the containers.

4,150,701
APPARATUS FOR FEEDING GRANULAR MATERIAL

Eugene L. Rebucci, Mt. Lakes, N.J., assignor to Merrick Scale Mfg. Company, Passaic, N.J.

Filed Jan. 19, 1978, Ser. No. 870,959
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—232 10 Claims



1. Apparatus for feeding granular material comprising a housing having an inlet at its upper end and an outlet at its lower end, a blade means rotatably mounted adjacent said lower end of said housing, said blade means including at least one blade curved in the direction of rotation for moving flowable material radially inwardly to said outlet, a shell supported in said housing above the elevation of said blade, a motor in said shell, said motor being connected to said blade for rotating said blade, an air inlet conduit means extending from outside said housing to said enclosure for supplying cooling air to said motor, an outlet conduit means extending from outside said housing to said enclosure for venting air from said enclosure, said enclosure being spaced inwardly from the inner periphery of said housing to define an annular flow path from said housing inlet to said housing outlet, and means supporting said housing in a manner so that the housing may be moved between an operative position and another position spaced laterally from said operative position.

4,150,702
LOCKING FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018

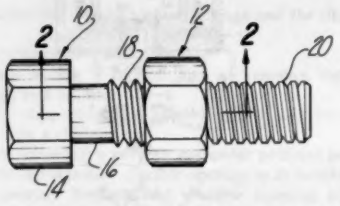
Filed Feb. 10, 1978, Ser. No. 876,863
Int. Cl.[2] F16B 39/02
U.S. Cl. 151—22 10 Claims

1. In a prevailing-torque fastener combination:
a first element having a helical thread form with leading and trailing flanks which lie at respective first angles to the thread axis and which, before threaded engagement with another element, intersect to define a crest of substantially constant diameter over the working length of said element;
a second element having a helical thread form with leading and trailing flanks which lie at respective second angles

relative to the thread axis and which are truncated to define a root surface;

the first and second elements being conjugally threadable with one another;

at least a portion of the second element having a thread depth of lesser dimension than the thread depth of the first element thereby to cause firm radial engagement between



the crest of the first element and the root surface when said elements are at least substantially fully threaded together;

the threads of said elements being configured to create longitudinal clearance between the flanks adjacent the engaging crest and truncated root sufficient to receive deformed material from said engaging crest when threaded together.

4,150,703

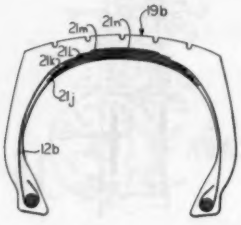
BELT SEPARATION-RESISTANT TIRE CONFIGURATION

Charles C. Sons, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 734,684, Oct. 22, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,815

Int. Cl.[2] B60C *9/20*

U.S. Cl. 152—361 R **2 Claims**



1. A pneumatic tire of the form having an annular tread region and a pair of annular bead regions of lesser diameter and a pair of side wall regions each extending from a separate one of said bead regions to a separate side of said tread region, further comprising:

a single transverse primary reinforcement ply formed of cords of reinforcing material extending continuously from one of said bead regions to the other thereof within said side wall regions and within said tread region, said primary reinforcement ply being located further from the inner surface of said tire in said tread region than in said sidewall regions

at least one outer belt of reinforcing material extending circumferentially within said tread region of said tire and being situated radially outward from the portion of said primary reinforcement ply which extends across said tread region, and

a plurality of inner belts of reinforcing material extending in a circumferential direction within said tread region of said tire, said plurality of inner belts being of progressively smaller diameter from the outermost of said plurality of inner belts to the innermost thereof, and being situated radially inwardly from the portion of said primary reinforcement ply which extends across said tread region, said plurality of inner belts being of progressively greater width from the outermost to the innermost thereof and wherein the lateral edges of each of said plurality of inner belts are adjacent the inner surface of said primary reinforcement ply and equidistant from said cords thereof.

4,150,704

METHOD OF PRODUCING SAND MOUNDS HAVING A FROZEN SURFACE

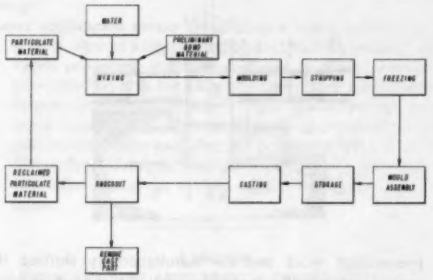
Frederick H. Hoult, Sheffield, England, assignor to W. H. Booth & Co., Ltd., England

Continuation of Ser. No. 712,645, Aug. 9, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,820

Claims priority, application United Kingdom, Aug. 14, 1975, 33989/75

Int. Cl.[2] B22C *1/00*

U.S. Cl. 164—12 **21 Claims**



1. A method or producing a mould of particulate material comprising admixing the particulate material with a controlled quantity of water, compacting the mixture to the required shape on a pattern or the like, removing the compacted mass from the pattern, and then directing at at least the surface of the removed, compacted mould to be contacted by molten metal a stream of coolant, whereby at least that surface is frozen to a depth sufficient to withstand the conditions imposed during the pouring of molten metal into the mould.

4,150,705

METHOD AND APPARATUS FOR MANUAL PREPARATION WORK ON FOUNDRY MOLDING BOXES AT A SINGLE-STATION THROUGHFLOW MOLDING MACHINE

Günter Müller, Karlsruhe, Fed. Rep. of Germany, assignor to Badische Maschinenfabrik G.m.b.H., Fed. Rep. of Germany

Filed Oct. 28, 1976, Ser. No. 736,579

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548577

Int. Cl.[2] B22C *25/00*

U.S. Cl. 164—18 **14 Claims**

1. A method of carrying out manual preparation work on foundry molding boxes at a single-station throughflow molding machine with linear transport of the molding boxes through the molding machine and alternate molding on at least two pattern plates, comprising the steps of: placing a box on one pattern plate; transferring the said plate together with the box on to the central station of a three-station preparation track extending adjacent to the molding machine parallel to the direction of the said transport; displacing the said plate on to one of the two outer stations of the said track for preparation work and at the same time shifting on to the central station the other pattern plate carrying a molding box prepared on the other outer station; transferring the other pattern plate and molding box to the molding machine for a molding operation in the said machine; extracting the latter pattern plate and mounting another molding box thereon; and transferring the

latter pattern plate and molding box to the free central station of the preparation track.

2. Apparatus for carrying out preparation work on foundry molding boxes, comprising:

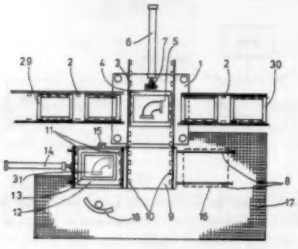
(a) a single-station throughflow molding machine;

(b) first and second pattern plates together with first and second molding boxes, respectively;

(c) a three-station preparation track means for performing work on mold cores, said preparation track means having a first side station, a second side station, and a central station separate and spaced from the single-station throughflow molding machine;

(d) transverse track means for transferring the first pattern plate together with the first molding box onto the central station;

(e) first thrust drive means for displacing the first pattern plate from the central station to the first side station for



preparation work and for simultaneously shifting the second pattern plate together with the second molding box prepared on the second side station onto the central station;

(f) second thrust drive means for transferring the second pattern plate together with the second molding box from the central station to the molding machine for an operation;

(g) a two-station transporting carriage means for transferring the first pattern plate together with the first molding box from the first side station to the central station; and

(h) roller track means for extracting and transferring the second pattern plate together with the second molding box from the molding machine, said roller track means being positioned transverse to the transverse track means and directly accessible to the central station of the preparation track means.

4,150,706

PROCESS FOR THE MANUFACTURE OF UNDULATED METALLIC ELEMENTS FOR THE REINFORCEMENT OF COMPOSITE MATERIALS

André Reiniche, Clermont-Ferrand, and Philippe Sauvage, Chateaugay, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

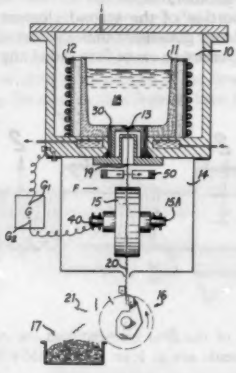
Filed May 30, 1978, Ser. No. 910,962

Claims priority, application France, Jun. 6, 1977, 77 17482

Int. Cl.[2] B22D *11/06*

U.S. Cl. 164—49 **6 Claims**

1. Process for the manufacture of filiform reinforcement elements of steel in the form of ribbons by projecting a jet of liquid steel onto a cylinder rotating in a cooling medium, characterized by imparting a relative reciprocating movement parallel to the axis of rotation of the cylinder between the jet of



liquid steel and the cylinder in order to undulate the ribbon in the direction parallel to the axis of rotation of the cylinder.

4,150,707

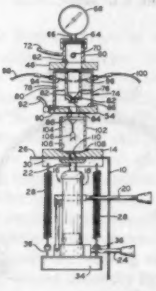
METHOD AND APPARATUS FOR MAKING DENTAL CASTINGS

Harold C. Emerick, 5007 Wayne Trace, Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 785,495, Apr. 7, 1977, abandoned. This application Jan. 5, 1978, Ser. No. 867,115

Int. Cl.[2] B22D *27/02, 27/14, 21/02*

U.S. Cl. 164—52 **16 Claims**



1. A method for making dental castings and the like comprising:

providing a porous casting investment mold having a pattern cavity therein,

providing a crucible positioned above the investment mold and having at least one small bottom opening in register with the investment mold cavity, said crucible and investment mold cavity being in fluid tight communication with each other,

providing a quantity of casting material in the crucible in a manner such that when the casting material is melted, it will flow into the crucible opening,

introducing a compressed gas beneath the crucible opening and above the investment cavity so as to flow the gas up through the opening and purge the crucible and establish a fluid pressure beneath the crucible opening and to continuously flow the gas through the investment mold thereby purging the same,

while continuing to introduce the compressed gas between the crucible opening and investment cavity, rapidly heating the casting material sufficiently to cause it to melt and

flow to the crucible opening, the pressure beneath the crucible opening preventing substantial sagging or dripping of the molten material into or through the crucible opening and then

admitting a compressed gas under pressure to the crucible above the molten casting material to force the casting material to flow through the crucible opening into the investment cavity, the pressure above the casting material being higher than the pressure below the crucible opening.

7. Apparatus for making dental castings and the like comprising:

means for supporting a casting ring,

a crucible having a bottom and an opening extending through said bottom,

means for supporting said crucible above said means for supporting a casting ring,

means for admitting a purging gas under pressure into said crucible through said crucible opening so as to establish a fluid pressure beneath said crucible opening whereby molten casting material to be contained in said crucible will be prevented from substantial sagging and dripping into or through said crucible opening,

means associated with said crucible for heating the casting material to be contained within the crucible, and

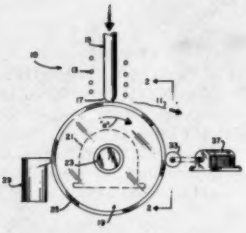
means for admitting a gas under pressure to said crucible above said crucible opening whereby the casting material to be contained within the crucible will be forced through said crucible opening.

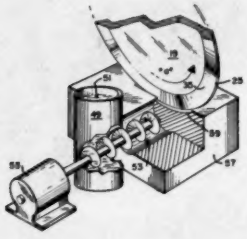
4,150,708

APPARATUS AND METHOD OF MAKING FILAMENTS

Robert J. Patton, Westford, and Martin P. Schrank, Ipswich, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 5, 1977, Ser. No. 857,267
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—72 **17 Claims**





1. In a method of forming solid filamentary elements from a pendant drop of molten material wherein said method includes engaging said pendant drop of molten material with the circumferential edge of a rotating wheel-like, heat-extracting member, solidifying said molten material on said circumferential edge to form said solid filamentary elements, and releasing said elements from said edge, the improvement comprising:

applying an easily removable protective layer in the form of a thin film of solid material to said circumferential edge of said heat-extracting member at a location prior to the position of engagement with said pendant drop and after the position of release of said filamentary elements, said protective layer adhering to said edge during the periods of said engagement and release.

11. In an apparatus for forming solid filamentary elements from a pendant drop of molten material wherein said apparatus includes heating means, said heating means heating said material to produce said molten drop thereon, a rotating, wheel-like, heat-extracting member located adjacent said heating means and having a circumferential edge thereon, said edge engaging said molten drop during rotation of said wheel-like, heat-extracting member and solidifying portions of said molten material to form said filamentary elements, said elements thereafter released from said edge, and rotating means operatively connected to said heat-extracting member, said rotating means rotating said heat-extracting member, the improvement comprising:

layer application means comprising a vapor producing assembly located adjacent said heat-extracting member, said vapor producing assembly applying an easily removable protective layer in the form of a thin film of solid material to said circumferential edge of said heat-extracting member at a location prior to the position of engagement with said pendant drop and after the position of release of said filamentary elements, said protective layer adhering to said edge during the periods of said engagement and release.

4,150,709

PROCESS FOR APPLYING A COATING TO A CENTRIFUGAL CASTING MOLD

Gottfried Brügger, Werksgelände 5, A-5503 Mitterberghutten, Austria

Filed Aug. 3, 1976, Ser. No. 711,503
Int. Cl.[2] B22D *13/10*
U.S. Cl. 164—72 **3 Claims**

1. A process for applying a heat-conductive and gas-permeable coating to a centrifugal casting mold for casting copper or alloys thereof and then casting thereover a pin-hole free copper alloy casting, said mold having an internal surface, said process comprising the steps of

introducing into the mold, prior to introducing the molten metal into the mold, a suspension of powdery material consisting essentially of zirconium oxide (ZrO_2) and an inorganic binder of aluminum oxide (Al_2O_3) in fine particle form,

applying said material to the interior surface of the mold in the form of a thin smooth layer having a thickness of 0.1–0.3 mm., so that a heat-conductive and gas-permeable layer which is non-gas producing is provided on the internal surface of the centrifugal casting mold and which thin, smooth, heat-conductive and gas-permeable layer is capable of rapidly cooling a molten copper or copper alloy melt cast thereagainst, and

thereafter centrifugally casting the molten copper or alloy thereof into said mold to form a pin-hole free casting of good dimensional accuracy.

4,150,710

DUMMY BAR HANDLING APPARATUS AND METHOD

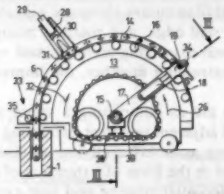
Wolfgang W. John, New York, N.Y., assignor to Concast Incorporated, Montvale, N.J.

Filed Nov. 2, 1977, Ser. No. 847,903
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—82 **9 Claims**

1. A continuous casting installation comprising:

(a) a casting platform;

(b) an open-ended mold supported by said casting platform;
(c) a flexible dummy bar for sealing the outlet end of said mold prior to the start of a cast and for initiating withdrawal of a continuously cast strand from said mold;
(d) a guide below said casting platform for guiding the strand along a predetermined path; and
(e) transporting means for lifting said dummy bar from said guide to a predetermined location of said casting platform spaced from said mold, transferring said dummy bar from said predetermined location to said mold and inserting said dummy bar into said guide via the inlet end of said mold, said transporting means including a carriage on said casting platform movable between said predetermined location and another location adjacent to said mold, and said carriage being provided with a part-circular, downwardly concave support for said dummy bar and an arm for engaging said dummy bar, said arm being telescopic



and being pivotally mounted on the axis of said support such that rotation of said arm in a predetermined sense when said arm engages said dummy bar causes said dummy bar to be drawn onto said support, and said transporting means further including actuating means for telescoping, retracting and pivoting said arm so as to telescope said arm into engagement with the leading end of said dummy bar when said leading end is adjacent to said support, pivot said arm while in engagement with said leading end to draw said dummy bar onto said support, retract said arm from said leading end when said dummy bar is on said support, pivot said arm towards the trailing end of said dummy bar and telescope said arm into engagement with said trailing end to thereby effect controlled insertion of said dummy bar into said guide, said transporting means also including holding means for holding said dummy bar on said support while said arm pivots from said leading end towards said trailing end.

4,150,711

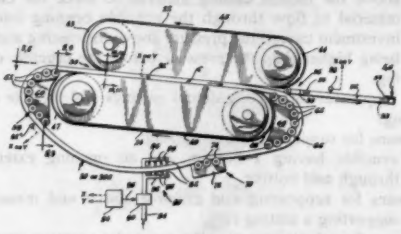
METHOD AND APPARATUS FOR CONTINUOUSLY CASTING METAL SLAB, STRIP OR BAR WITH PARTIAL THICKNESS INTEGRAL LUGS PROJECTING THEREFROM

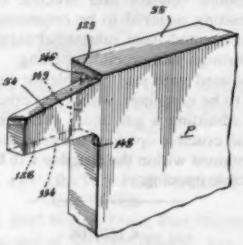
Robert W. Hazelett, Winooski, and John F. B. Wood, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Filed Sep. 30, 1977, Ser. No. 838,079
Int. Cl.[2] B22D *11/06, 11/16*
U.S. Cl. 164—87 **44 Claims**

1. The method of continuously casting a metal slab comprising the steps of providing a casting region with an endless revolving casting belt for supporting the molten metal and a pair of laterally spaced endless revolving edge dams travelling along either edge of the casting region and with the casting belt at substantially the same speed as the belt, providing in said edge dams partial depth mold pockets communicating with the casting region and having a depth less than the depth of the casting region, introducing molten metal into the casting region and cooling the molten metal in the casting region to form a continuously cast slab having integral partial thickness lugs extending from opposite edges thereof.

20. Apparatus for continuously casting a metal slab comprising at least one endless revolving flexible casting belt for supporting the molten metal in a casting region and a pair of laterally spaced endless revolving edge dams travelling along at substantially the same speed as the belt for defining opposite edges of the casting region, each of said edge dams having a predetermined height, and each of said edge dams having a plurality of partial depth mold pockets therein at spaced posi-





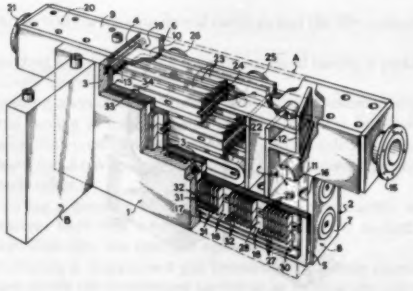
tions along the edge dam, said mold pockets communicating with the molten metal in the casting region and having a depth less than the predetermined height of the edge dam for continuously casting a metal slab having integral partial thickness lugs extending from opposite edges thereof.

4,150,712

CONTINUOUS-CASTING MOULD PROVIDED WITH AN ELECTROMAGNETIC STIRRING DEVICE

Bernard Dussart, Haulchin, France, assignor to Union Siderurgique du Nord et de l'Est de la France, Paris, France

Filed Feb. 28, 1978, Ser. No. 882,045
Claims priority, application France, Mar. 3, 1977, 77 06293
Int. Cl.[2] B22D *27/02, 11/10*
U.S. Cl. 164—147 **10 Claims**



1. A continuous-casting mould structure comprising copper walls defining a copper mould and walls defining a cooling box which at least partly surrounds the mould, the cooling box comprising a first chamber and second chamber, the first chamber being defined by one of said walls of the mould and

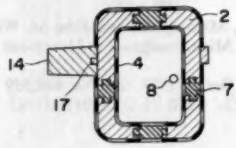
by a substantially parallel front wall of the box which front wall is made at least in part from stainless steel, said first chamber being intermediate the second chamber and the mold and an electromagnetic induction stirring device mounted inside said second chamber and comprising cores, field-producing coils mounted on the cores, and the induction stirring device further comprising poles of magnetic steel in contact with the cores, the poles being embedded in said front wall and extending substantially throughout the width of the first chamber and extending throughout the thickness of said front wall and having portions which extend through said first chamber into contacting relationship with one of said copper walls.

4,150,713

FLEXIBLE PATTERN TO BE USED FOR CASTING MOLDS

Mitushi Mio, Sumoto, Japan, assignor to Awaji Sangyo Kabushikikaishi, Hyogo, Japan

Filed Mar. 21, 1977, Ser. No. 779,831
Claims priority, application Japan, Mar. 27, 1976, 51-034091
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] B22C *7/00*
U.S. Cl. 164—237 **5 Claims**



1. A flexible pattern for use in forming a casting mold, said flexible pattern comprising:

a hollow outer pattern member formed by a plurality of outer plates, adjacent edges of said plates being coupled by elongated outer joint members extending between said adjacent edges, the exterior surfaces of said plates and said joint members together having a configuration corresponding to the shape of a predesigned casting outer surface, said joint members being selectively freely slidably removable from between said plates in directions substantially parallel to said adjacent edges, to thereby form gaps between said plates;

a fluid tight bag positioned within the interior of said pattern member and attached to inner surfaces of said plates;

whereby, upon supplying fluid into the interior of said bag, said bag expands against the interior of said pattern member; and

upon the removal of said joint members from between said plates and upon the discharge of fluid from within the interior of said bag, said bag comprises means for pulling said plates inwardly.

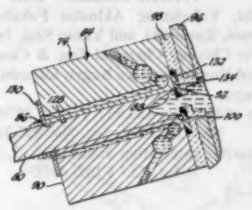
4,150,714

LEAD CASTING SEAL

Larry P. Atkins, Daleville, and James R. Bish, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1977, Ser. No. 819,895
Int. Cl.[2] B22D *11/10, 11/124*
U.S. Cl. 164—440 **4 Claims**

1. In apparatus for continuously casting lengths of lead including an open-ended mold having a melt inlet at one end thereof, a source of lead melt coupled to the inlet end of the mold, a block of insulating material disposed between said mold and said source for substantially thermally isolating the mold from the source, and an orifice through said block for passing melt from said source into said inlet, the improvement comprising: said mold having a peripheral sealing edge at the mouth of the inlet compressively engaging a sealing member located between the inlet and the block, said sealing member comprising in major proportion an aromatic polyimide resin



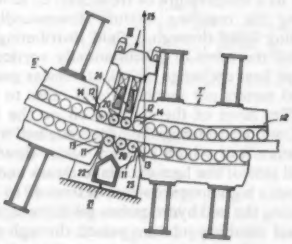
which is stable at the temperature of the lead melt and effective to provide a snag-free release surface for melt solidified at the inlet.

4,150,715

SUPPORTING AND GUIDING MEANS FOR CAST STRANDS

Franz Kagerhuber, Traun, and Werner Scheurecker, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 22, 1977, Ser. No. 826,944
Claims priority, application Austria, Sep. 9, 1976, 6679/76
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—448 **4 Claims**



1. In a supporting and guiding means for cast strands, in particular slabs cast in a bow-type continuous casting plant, of the type including a plurality of exchangeable supporting elements, one of said supporting elements being a circular-arc-shaped element and another of said supporting elements being a straightening element located next to said circular-arc-shaped element, said supporting elements being each provided with rollers at opposite sides thereof, the improvement which is characterized in that neighbouring supporting elements are provided with shoulder-like projections where they are separated from each other, said shoulder-like projections being oppositely arranged and backing each other, one roller being mounted on each of said shoulder-like projections so as to complement each other and to form a pair of oppositely arranged rollers, one of said shoulder-like projections with a roller mounted thereon being provided on said circular-arc-shaped element and the oppositely arranged shoulder-like projection with the oppositely arranged roller mounted thereon being provided on said straightening element.

4,150,716
METHOD OF HEAT RECOVERY FROM THERMALLY DECOMPOSED HIGH TEMPERATURE HYDROCARBON GAS

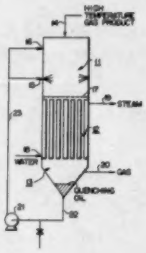
Kiyoji Ozaki, Yokohama; Akinobu Fukuhara, Sagamihara; Takuji Hosoi, Kawasaki, and Yasuo Sagi, Iwaki, all of Japan, assignors to Chiyoda Chemical Eng. & Constr. Co. Ltd., Yokohama and Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 655,957, Feb. 6, 1976. This application Nov. 28, 1977, Ser. No. 855,310

Claims priority, application Japan, Feb. 7, 1975, 50-15252

Int. Cl.[2] F28D *7/00*

U.S. Cl. 165—1 **8 Claims**



1. A method of recovering heat from a high temperature gas product obtained by thermal decomposition of hydrocarbons in the form of high pressure steam which comprises

(a) precooling, in a vessel comprising a precooling zone, a heat exchange zone and a separating zone, the high temperature gas product in the precooling zone by mixing said gas product with a sprayed low temperature and hydrocarbon oil of a by-product obtained from said thermal decomposition of hydrocarbons, which contains from 30 to 80 percent by weight of a pitch based on the weight of said sprayed low temperature hydrocarbon oil, as a quench to a temperature of from 300° C. to 400° C.;

(b) passing the resulting mixture downwardly from the precooling zone through a fluid distributing perforated plate and the tubes of a substantially vertical shell-and-tube type heat exchange means, at a linear gas velocity of 15 to 50 meters per second in said tubes to form a thin liquid film layer of the sprayed oil on the inside walls thereof, and transferring the heat contained in said resulting mixture into a high pressure water flowing through the shell side of the heat exchange means and recovering therefrom a high pressure steam of from 40 to 100 kg/cm^2;

(c) separating the said hydrocarbon oil in the separating zone from said resulting mixture passed through the tubes of said heat exchange means downwardly to the separating zone; and

(d) recirculating the separated hydrocarbon oil as a quench to the precooling zone.

4,150,717
INTERLOCKING CHECKER TILE

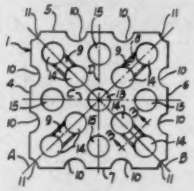
George L. Balke, Cleveland, and Edward F. Jablonski, Brecksville, both of Ohio, assignors to Arthur G. McKee & Company, Independence, Ohio

Filed Jan. 7, 1977, Ser. No. 757,638

Int. Cl.[2] F28D *17/00*

U.S. Cl. 165—9.1 **26 Claims**

1. A checker tile comprising a tile portion generally of the shape of a parallelepiped having two oppositely facing ends and four sides intersecting said ends and forming a boundary for said tile portion, said ends of said tile portion being each generally square and having a pair of substantially straight diagonal axes which extend between opposite corners of said tile portion and which intersect generally in the center of the end, said tile portion having a plurality of symmetrically spaced apertures which extend through the tile portion between the ends, said tile portion also having rib means and groove means extending on the ends of said tile portion between pairs of said apertures and terminating entirely within



said boundary, said rib means and groove means being located along said axes on both sides of the intersection of the axes, said groove means being adapted to receive and fit closely rib means on an abutting end of another checker tile.

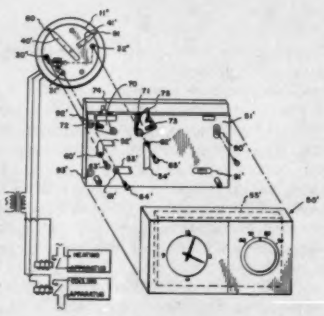
4,150,718
REPLACEMENT THERMOSTAT ADAPTER WALL PLATE

Donald P. Kolbow, Minneapolis, and John M. Whitney, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 7, 1977, Ser. No. 840,359

Int. Cl.[2] F25B *29/00;* **H01H** *37/62*

U.S. Cl. 165—12 **8 Claims**



1. In an adpater wall plate for a second condition responsive device, the adapter wall plate being adapted to attach to a wall plate of an already existing condition responsive device which has means for mechanically holding said existing device and a circuit electrically connecting said existing device to remote condition control apparatus so that with said adapter wall plate, said second condition responsive device can replace the already existing condition responsive device without the removal of connection wires from the wall plate to the remote condition control apparatus and the connection of the second condition responsive device is made by attaching the adapter wall plate to the wall plate,

a support member adapted to support the second condition responsive device in an operative manner,

circuit means on said support member, said circuit means being adapted to be connected to the second condition responsive device, and

connection means adapted for connecting said support member and said circuit means to a wall plate from which an already existing condition responsive device has been removed so that said support member is mechanically held and said circuit means is properly connected to a circuit

means of the wall plate to provide for proper operation of the remote condition control apparatus by the second condition responsive device.

4,150,719

PROCESS AND APPARATUS FOR CONTROLLED AND GENTLE HEATING OR COOLING OF VISCOUS SOLUTIONS OR MELTS OF THERMOPLASTICS

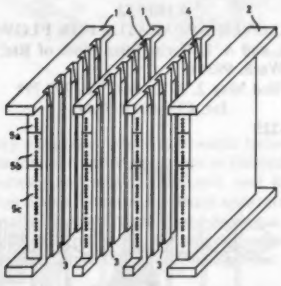
Gunter Thielen, Ludwigshafen; Johann Zizlsperger, Schriesheim; Rudi W. Reffert, Beindersheim; Hans Wild, Frankenthal, and Peter Fink, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,885

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555079

Int. Cl.² F28F *3/08*

U.S. Cl. 165—140 **4 Claims**



1. An apparatus for the controlled temperature conditioning of a viscous solution or melt of a thermoplastic material, said apparatus comprising:

at least two solid metal segments each having correspondingly formed side surfaces designed to abut each other in a leak-tight manner when in an assembled form so as to allow heat to flow therebetween;

a series of generally parallel slip-shaped channels formed at a substantially uniform depth in at least one of said abutting side surfaces for receiving and guiding said thermoplastic material from a charging end of said assembled segments to a discharging end thereof; and

said segments being subdivided into a plurality of zones extending generally across said channels, said segment zones having cavity-like passages formed therein for receiving a heat carrier medium, whereby said zones can be operated at different temperatures for the controlled temperature conditioning of said thermoplastic material as it passes through said channels.

4,150,720

HEAT EXCHANGER

Derek S. Brackman, Stanmore, England, assignor to Imperial Chemical Industries Limited, London, England

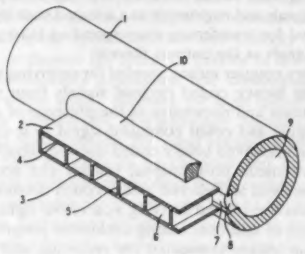
Filed Apr. 22, 1977, Ser. No. 790,002

Claims priority, application United Kingdom, Apr. 29, 1976, 17492/76; Oct. 12, 1976, 42317/76; Dec. 1, 1976, 50093/76

Int. Cl.² F28F *3/12*; F24J *3/02*

U.S. Cl. 165—170 **10 Claims**

1. A heat exchanger of thermoplastics material comprising two spaced-apart headers interconnected by an extruded board having a profile comprising a plurality of tubular passages extending from one end of the board to the other; each tubular header having a longitudinal groove in its exterior surface and a plurality of holes spaced along the groove, the holes interconnecting the groove and the interior of the header; each end of the board being located along the groove of one of the headers; each header being held in position by a sealing bead adhering to both the header and the board, and extending continuously right round the mouth of the groove where



covered by the board, the seal against loss of any fluid flowing between the header and the tubular passages of the board.

4,150,721

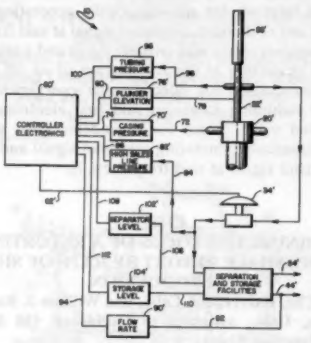
GAS WELL CONTROLLER SYSTEM

William L. Norwood, 232 Crestview Rd., Columbus, Ohio 43202

Filed Jan. 11, 1978, Ser. No. 868,674

Int. Cl.² E21B *43/00, 43/12*

U.S. Cl. 166—53 **17 Claims**



1. In a flowing gas well installation of a variety having a casing, a tubing string therein having its lower end open adjacent the lower level of the casing, said tubing string being connectable to a sales line and having a motor valve positioned intermediate said tubing string and sales line actuable in response to an on or off designated pneumatic state between open and closed orientations to derive respective producing and shut-in conditions of performance for said installation the improved controlled for actuating said motor valve, comprising:

means providing a d.c. source of power;

pneumatic valve means connectable between a source of gas under pressure and said motor valve and including first and second electromagnetically actuated valve means energizable from said source of power to direct said gas under pressure to effect respective said motor valve actuating on and off pneumatic states;

oscillator means coupled with said power supply for deriving a pulse train of predetermined stable frequency;

frequency divider means including multi-stage solid-state ripple carry counters for deriving at least one pulse train of frequency f_1;

display means selectively energizable from a plurality of driver input signals thereto to provide multi-segment derived visible indicia representative of time in hours and subdivisions thereof;

manually programmable switch means coupled with said source of power for generating binary coded decimal

signals representative of selected time intervals represented in hours and subdivisions thereof for each said designated pneumatic state;

multiplexer means for receiving said binary coded decimal signals and responsive to a selected state input select signal and for transferring corresponding binary coded decimal signals at the outputs thereof;

binary counter means coupled for receiving said corresponding binary coded decimal signals from said multiplexer means and responsive in the presence of an asserted load signal and count command signal to in-crementally alter said received binary coded decimal signals in diminishing arithmetic progressional fashion and provide the initial received and altered binary coded decimal signals at outputs thereof and deriving a carry-out signal at the termination of said diminishing arithmetic progression;

driver means connected for receiving said binary counter means initially received and altered binary coded decimal signals to derive said driver input signals asserted at said display means;

off-state switch means actuable to derive an off-start signal;

on-state switch means actuable to derive an on-start signal; and

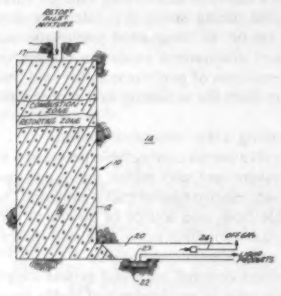
control circuit means responsive to a said off-start signal and a said carry-out signal occurring at the termination of an on designated pneumatic state and including timed switching means for effecting the energization of said second electromagnetically actuated valve means for a predetermined interval, for simultaneously generating said load signal and said count command signal at said frequency, f_1 and responsive to a said on-start signal and a said carry-out signal occurring at the termination of an off designated pneumatic state for effecting the energization by said timed switching means of said first electromagnetically actuated valve means for a predetermined interval for simultaneously generating said load signal and said count command signal at said frequency, f_1.

4,150,722

DETERMINING THE LOCUS OF A RETORTING ZONE IN AN OIL SHALE RETORT BY RATE OF SHALE OIL PRODUCTION

Chang Y. Cha, Bakersfield, Calif., and William J. Bartel, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Mar. 10, 1978, Ser. No. 885,118
Int. Cl.[2] E21B *43/24, 43/26, 47/00*
U.S. Cl. 166—251 **20 Claims**



1. A method for determining the locus of a retorting zone advancing through a fragmented permeable mass of particles containing oil shale in an in situ oil shale retort in a subterranean formation containing oil shale, said subterranean formation including a plurality of generally horizontal strata having differing kerogen contents, the method comprising the steps of:

forming an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale in the formation, the fragmented mass containing generally horizontal layers of particles corresponding to such strata;

determining kerogen content in at least one such layer in the fragmented mass;

predicting a production rate of shale oil from the kerogen content in said layer in the fragmented mass;

advancing a retorting zone through the fragmented mass for producing shale oil from kerogen in oil shale;

withdrawing shale oil from a lower portion of the fragmented mass;

determining a production rate of shale oil from the retort; and

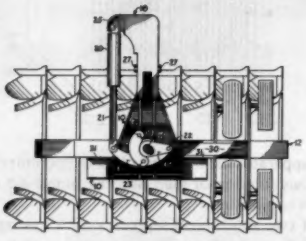
comparing such a determined production rate of shale oil from the retort with such a predicted production rate of shale oil for determining when the retorting zone advances through said layer.

4,150,723

ROLLOVER APPARATUS FOR PLOWS

Alton N. Filan, and A. LaVerne Filan, both of Rte. 1, Box 69, Waitsburg, Wash. 99361

Filed May 2, 1977, Ser. No. 792,791
Int. Cl.[2] A01B *3/44*
U.S. Cl. 172—225 **1 Claim**



1. A rollover apparatus for a two-way plow having a supporting mobile framework and a plow frame pivotally mounted to the mobile framework about the center axis of a pivot shaft, comprising:

a rigid crank arm operatively fixed to the plow frame and extending radially outward from the center axis of the pivot shaft for joint coaxial movement with the pivot shaft;

an elongated rigid lever arm pivotally connected at one end to the crank arm about a first axis parallel to and spaced from the center axis of the pivot shaft, said lever arm having an arcuate side edge facing toward said pivot shaft and enabling the lever arm to wrap about the pivot shaft as the shaft is turned about its center axis through an angular distance of at least 180° degrees;

said elongated lever arm extending angular outward from the crank arm to one side of said center axis;

an intermediate rigid link having a first end pivotally connected to said framework about a second axis parallel to and spaced to one side of the center axis of the pivot shaft, the remaining end of said link being pivotally connected to said lever arm about a third axis parallel to said center axis of the pivot shaft;

a hydraulic cylinder having an extensible piston rod movably mounted therein;

said hydraulic cylinder being pivotally mounted to said framework about a fourth axis parallel to said center axis of the pivot shaft;

the outer end of said piston rod being pivotally mounted to said lever arm about a fifth axis spaced outwardly along the length of said lever arm from said third axis and parallel thereto, whereby pivotal forces are transmitted from the framework to the crank arm directly through the

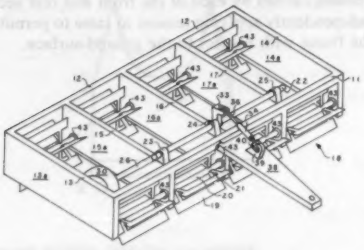
pivotal connections between the piston rod of the hydraulic cylinder and the lever arm.

4,150,724

ROTARY STALK CHOPPER APPARATUS

Dwight W. Strobel, Clarks, Nebr. 68628

Continuation of Ser. No. 744,702, Nov. 24, 1976, abandoned.
This application Jul. 10, 1978, Ser. No. 923,061
Int. Cl.[2] A01B *21/00*
U.S. Cl. 172—328 **9 Claims**



1. A rotary apparatus which is towable behind an agricultural vehicle for high speed operation in chopping vegetation and for churning and working the soil, and for high speed transportation to and from the field, said apparatus comprising:

a horizontally disposed, rigid frame having a lateral axis in the direction of pulling and a longitudinal axis normal to the direction of pulling, and defining front and rear portions thereof;

a plurality of downwardly extending shaft support plates disposed in spaced relation to said frame to define thereby a plurality of compartments for containing rotary shredder reels;

a plurality of rotary shredder reels disposed in tandem within each compartment defined by said downwardly extending shaft support plates to form front and rear shredder assemblies, each rotary shredder reel having

a reel shaft,

a plurality of shredder blades connected to and extending longitudinally of each said reel shaft and radially protruding therefrom, and

means for connecting said shredder blades to said reel shaft in radial and equicircumferential disposition,

whereby said shredder blades are rapidly rotated by their engagement with the earth in response to such high speed towing of the apparatus along the ground, thereby to chop any vegetation within their path and simultaneously to churn and work the soil;

paired, facing reel shaft bearing means carried by said support plates for journaling each of said reel shafts for independent rotation;

wheel extension and retraction means carried in downward and rearward disposition for absorbing shocks to said wheel extension and retraction means such as may result from such rapid transportation thereof over rough ground during such high speed towing to and from the field, said wheel extension and retraction means carried by said frame for raising and lowering said frame between a raised position for transportation of the rotary apparatus to and from the field, and a lowered position for disposing the rotary shredder reels in operative contact with the surface of the ground for chopping present vegetation and for working and churning the soil;

wheel means borne by said wheel extension and retraction means, said wheel means movable by means of said wheel extension and retraction means from a first disposition in contact with the ground corresponding to the lowered position of said wheel extension and retraction means and a second disposition above the ground corresponding to the raised position of said wheel extension and retraction means to dispose said rotary shredder reels below the level of said wheel means, said wheel means disposed approximately equidistant said front and rear shredder assemblies with respect to the lateral axis of said frame and disposed interior of the extremities of said shredder assemblies approximately equidistant from and laterally to said lateral axis, to dispose the center of gravity of the rotary apparatus substantially equidistant and substantially between said wheel means, whereby the high speed rotary apparatus is substantially symmetrically balanced both laterally and longitudinally for rapid chopping progress across the field of stalks to be chopped and for rapid transportation to and from the field to be worked; and

a tongue for connecting the rotary apparatus to the agricultural vehicle, said tongue hingedly connected to the front portion of said frame for limited radial motion about the longitudinal axis of said frame, said tongue operatively connected to said wheel extension and retraction means for urging said tongue radially downward during extension of the wheel means and radially upwardly during retration,

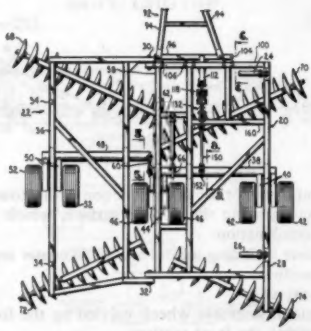
whereby the effective weight on said front and rear portions of said frame may be maintained in substantially balanced symmetry when said frame is lowered for chopping.

4,150,725

IMPLEMENT WITH COMPENSATION FOR TERRAIN IRREGULARITIES

John C. Crumrine, Cawker City, Kans., assignor to Richardson Manufacturing Company, Inc., Cawker City, Kans.

Filed Jul. 6, 1976, Ser. No. 704,070
Int. Cl.[2] A01B *59/042*
U.S. Cl. 172—678 **4 Claims**



1. In an implement having soil-engaging tools supported beneath a frame from which a tongue extends for connecting the implement to a tractor, the tongue being pivoted on the frame about a transverse horizontal axis, a counterpoise connection between the tongue and the frame for yieldably holding the tongue in a normal operative position and permitting the tongue to self-adjust when uneven terrain is traversed, said connection comprising:

a compensator assembly presenting a link having opposed ends,

means securing said ends to said tongue and said frame respectively,

said ends being normally spaced apart a distance which is preselected to cause said assembly to hold said tongue in its normal position, and said assembly having a pair of components movable relative to each other in directions to vary the spacing between said ends to lengthen or shorten the link and thereby permit the position of the tongue to change,

one of said components including a central guide rod having an end portion presenting one of said ends of the link,

the other of said components including a sleeve telescoped over said central rod and presenting the other of said ends of the link, outboard guide rods spaced from said central rod and extending in general parallelism therewith, and means extending transversely from said sleeve and rigidly securing said outboard rods thereto,

said assembly being provided with a pair of spaced bearing plates carried by said rods and shiftable thereon longitudinally thereof, and a plurality of compressible spring devices telescoped over corresponding central and outboard rods in compression between said members for yieldably resisting movement of said components in either of said directions and biasing said members toward normal, spaced-apart positions corresponding to said preselected distance,

said spring devices preventing relative movement of the tongue and frame about said axis under the reaction forces against the tools produced by the resistance of the soil, but being sufficiently yieldable to permit the tongue and frame to undergo said relative movement to change the position of the tongue in response to irregularities in the terrain along the path of travel of the tractor and implement, and

said central and outboard rods having means thereon engaging said members to shift the same toward each other along said rods and further compress said devices upon movement of the components in either of said directions.

4,150,726

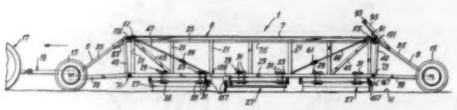
LAND PLANE

Jerry Weitlow, 5112 W. Maple, Paragould, Ark. 72450

Filed Aug. 10, 1977, Ser. No. 823,446

Int. Cl.[2] E02F *3/76*

U.S. Cl. 172—780 **31 Claims**



1. A land plane for use in conjunction with a tow vehicle for leveling and grading the ground surface, which plane comprises, in combination:

(a) a frame including a front section, a center section, and a rear section;

(b) a front axle;

(c) a pair of steerable wheels carried by the front axle for supporting the front section;

(d) a rear axle;

(e) a pair of steerable wheels carried by the rear axle for supporting the rear section;

(f) grader means carried by the center section;

(g) first steering means for steering the front wheels;

(h) second steering means for steering the rear wheels and selectively engageable with either the first steering means for steering the rear wheels in response to the steering of the front wheels or a separate power supply source for steering the rear wheels independently of the front wheels during movement of the land plane; and

(i) control means for selectively engaging the second steering means with either the first steering means or the separate power supply source.

17. A land plane for use in conjunction with a tow vehicle for leveling and grading the ground surface, which plane comprises, in combination:

(a) a frame including a front section, a center section and a rear section;

(b) a front axle;

(c) a pair of steerable wheels carried by the front axle for supporting the front section;

(d) a rear axle;

(e) a pair of steerable wheels carried by the rear axle for supporting the rear section;

(f) grader means carried by the center section;

(g) means carried by the center section and disposed substantially adjacent the ends thereof for applying tension to the center section to remove sag in the frame between the front and rear wheels and permit vertical alignment of the grader means with respect to the ground surface; and

(h) means carried by each of the front and rear sections for independently applying tension to same to permit aligning the frame with respect to the ground surface.

4,150,727

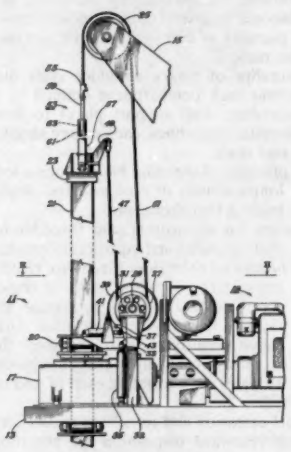
DOWNCROWDING DEVICE FOR EARTH BORING MACHINES

William L. Shepherd, West University Place, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jan. 11, 1978, Ser. No. 868,602

Int. Cl.[2] B23Q *5/00*

U.S. Cl. 173—147 **9 Claims**



1. In an earth boring apparatus having a mast, a drive member carried by the mast for linear movement and means for rotating the drive member, the drive member adapted to receive and rotate earth cutting tools for penetrating the earth, an improved downcrowding means for exerting a downward force on the drive member, comprising:

a rotatable drum;

hydraulic ram means connected to the drum for moving the drum downwardly;

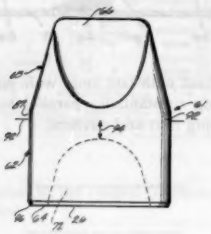
brake means connected with the drum for selectively preventing rotation of the drum; and

a cable connected to the drive member and wrapped around the drum for exerting a downward force on the drive member by the hydraulic ram means when the brake is actuated.

4,150,728
ROCK DRILL BIT INSERTS WITH HOLLOW BASES

Lloyd L. Garner, San Clemente; George R. Herrick, Irvine, and Charles R. Harris, Whittier, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 745,361, Nov. 26, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,570
Int. Cl.[2] E21B 9/08
U.S. Cl. 175—374 7 Claims



1. An earth drilling rock bit comprising:
a rock bit body;
a plurality of rolling cone cutters mounted on the rock bit body;
a plurality of recesses opening to an outer surface of such a rolling cone cutter; and
a tungsten carbide insert interference fitted into each of such recesses;
such a recess having a cylindrical wall portion extending away from the outer surface of the rolling cone cutter and a bottom portion for engaging the inner end of such an insert; and
such an insert comprising:
a cylindrical base portion with a diameter of at least about ¾ inch, the diameter of the base portion being larger than the diameter of the cylindrical recess for providing an interference fit along the base portion of the insert;
an end portion converging from the outer end of the base portion to form a work surface extending beyond the outer surface of the rolling cone cutter; and
a cavity opening to the inner end of such insert in the recess opposite the work surface of such insert, the cavity extending into the cylindrical base portion a distance of at least about 40% of the diameter of the cylindrical base portion and having a volume in the range of from about 15 to 30% of the volume of the base portion of the insert, the minimal wall thickness of the base portion of such insert between the cavity and the cylindrical surface of the base portion being at least about ⅛ inch.

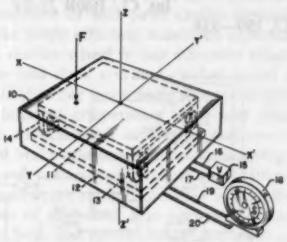
4,150,729
STRAIN GAUGE FLEXURE ISOLATED WEIGHING SCALE

A. Newman Ormond, 11969 E. Rivera Rd., Santa Fe Springs, Calif. 90670

Filed May 9, 1978, Ser. No. 904,239
Int. Cl.[2] G01G 3/14, 3/08
U.S. Cl. 177—211 16 Claims

1. A strain gauge flexure isolated weighing scale including an integral load member having an end portion for receiving a load and a central body portion secured in a stationary position with a flexure support means integrally connecting said central body portion to said end portion, said flexure support means including:

(a) first, second, third and fourth horizontal flexure webs disposed one below the other in vertically spaced relationship having first ends integrally secured to said central body portion and second ends extending towards said end portion, said end portion including first and second coplanar vertical flexure webs, said first vertical flexure web being connected between the extending second ends of said first and second horizontal flexure webs and said second vertical flexure web being connected between the



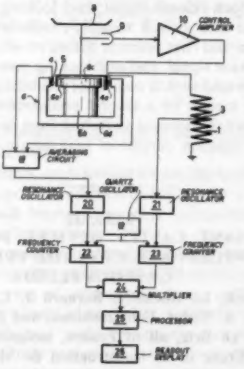
extending second ends of said third and fourth horizontal flexure webs; and,

(b) strain gauge means secured to at least one surface of at least one of said second and third horizontal flexure webs respectively.

4,150,730
ELECTROMAGNETICALLY COMPENSATING WEIGHING OR FORCE-MEASURING DEVICE

Erich Knothe, Bovenden, and Christoph Berg, Gottingen, both of Fed. Rep. of Germany, assignors to Sartorius Werke GmbH, Gottingen, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,087
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658628
Int. Cl.[2] G01G 7/00
U.S. Cl. 177—212 27 Claims

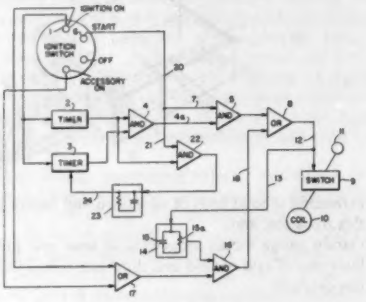


1. In an electromagnetically compensating force-measuring or weighing device having a working coil disposed in an air gap of a fixed magnetic circuit and subject to the influence of the load to be measured, an indicator means responsive to the position of the working coil, a control amplifier coupled to the indicator means and responsive to its output, and means for feeding an output signal from the control amplifier to the working coil for bringing it to a zero position, the improvement comprising an additional coil connected electrically in series with said working coil, and a first measurement sensor means positioned to sense the magnetic field of said additional coil free of system feedback for producing an output signal representative of the current flowing through said working coil and said further coil.

4,150,731
LOCKING DEVICE

Wesley Tannenbaum, 15 Francis St., Newton Center, Mass. 02159

Filed Dec. 14, 1977, Ser. No. 860,334
Int. Cl.[2] B60R 25/04
U.S. Cl. 180—114 8 Claims



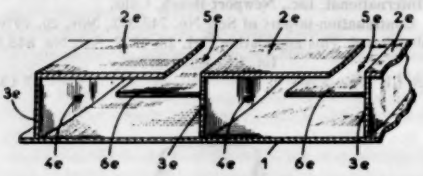
1. In an engine-powered vehicle having an ignition circuit and an ignition switch means with a plurality of circuit positions, the improvement which comprises an anti-theft arrangement comprising timing means responsive to said switch means and actuated when said switch means is switched to a first position for transmitting a non-sensible lock release signal after a non-sensible predetermined time interval from the instant of actuation of said timing means, said lock release signal having a predetermined duration, and electronic locking means operable in the locked state to disable said engine, said locking means being connected to said timing means for receiving said lock release signal and being responsive to said switch means, said locking means becoming unlocked only when said lock release signal is applied thereto and said switch means is switched to a second position after said time interval and within said duration of said lock release signal, said locking means remaining locked when said switch means is switched to said second position from said first position before or after said duration of said lock release signal, and said locking means includes means responsive to said switch means for inhibiting the unlocking of said locking means for a second predetermined time interval when said switch means is switched from said first position to said second position outside of said duration of said lock release signal.

4,150,732
IN RESONANT CAVITY DEVICES FOR REDUCING NOISE WITHIN A DUCT IN THE PRESENCE OF A GASEOUS FLUID

Rene G. Hoch, La Rochette; Bernard J. L. Jubelin, Cesson; Pierre M. A. Sarlat, Fontainebleau, and Pierre Thomas, La Houssaye en Brie, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,796
Claims priority, application France, Jan. 11, 1977, 77 01142
Int. Cl.[2] F01N 1/02
U.S. Cl. 181—213 14 Claims

1. A chamber for attenuating the acoustical energy propagating within a channel traversed by a gaseoue flow, comprising two substantially coaxial shells, wherein the inner wall of the inner shell delimits the flow channel, the space between the two shells being divided by partitions which separate independent annular cavities each of which communicates with the channel through at least one opening provided in the inner shell, and said cavities thus forming annular acoustic resonators which attenuate, in a given frequency range, the acoustical energy propagating in the channel, said chamber being characterized by the fact that each opening opens into the corresponding cavity through a bent duct having two angularly related branches which extend into the interior of said cavity, one of said branches being joined to the inner shell and opening

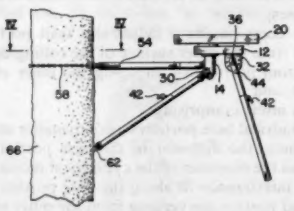


into the channel flush with said inner wall, and the other of its branches extending substantially parallel to the axis of the channel and opening into said cavities.

4,150,733
SPORTSMAN'S SEAT

Mace E. Plummer, Rte. 2, Box 39, Siren, Wis. 54872

Filed Dec. 29, 1977, Ser. No. 865,524
Int. Cl.[2] A45F 3/26
U.S. Cl. 182—187 3 Claims



1. A sportsman's seat assembly comprising, in combination, a supporting frame, a seat rotatably mounted thereon; pivots depending from said frame; telescopic legs mounted thereof; locking means for fixing said legs at a desired angular position relative to said frame; a footrest removably mounted at the end of one of said legs; a tree engaging clamp mounted at the end of another of said legs and means for securing said clamp about a tree trunk.

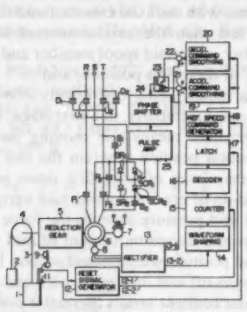
4,150,734
ELEVATOR CONTROL APPARATUS

Takeshi Ohira, Katsuta; Tadao Kameyama, Higashiibaraki; Chihiko Honzyo, Katsuta; Yuzaburo Iwasa, Hitachi, and Takanobu Hatakeyama, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 24, 1978, Ser. No. 871,801
Int. Cl.[2] B66B 1/30
U.S. Cl. 187—29 R 15 Claims

1. An elevator control apparatus including a motor for driving a car running in an elevator hoistway, a device for generating a speed command signal in accordance with the position of said car, and a device for controlling said motor in response to said speed command signal and a feedback signal of the speed of said motor; said elevator control apparatus further comprising an AC tachometer generator driven by said car drive motor, a rectifier circuit for rectifying the output of said AC

tachometer generator to deliver said speed feedback signal, and a counter for detecting a car position by counting the



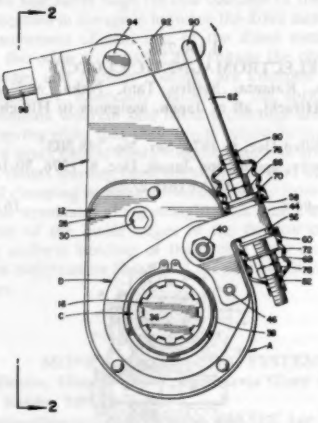
number proportional to the output frequency of said AC tachometer generator.

4,150,735

SLACK ADJUSTER ASSEMBLY

Leon R. Acre, Ovid, and Marquis J. Lake, Sr., Corunna, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 4, 1977, Ser. No. 774,231
Int. Cl.[2] F16D *65/52*
U.S. Cl. 188—196 BA **3 Claims**



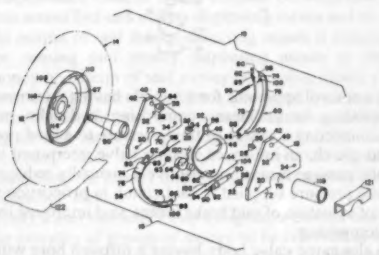
1. A slack adjuster mechanism for brakes comprising; a one-piece unitary ratchet wheel mountable on a shaft for rotation therewith about an axis, a slack arm mounted on said ratchet wheel for rotation relative thereto about said axis, a pawl carrier mounted directly on said ratchet wheel on one side of said slack arm for rotation relative to said ratchet wheel and slack arm about said axis, a first pawl positioned between said slack arm and ratchet wheel for normally rotating said ratchet wheel with said slack arm through a normal predetermined stroke between brake released and brake applied positions, a second pawl positioned between said pawl carrier and ratchet wheel for normally providing rotation of said pawl carrier with said ratchet wheel and slack arm through said predetermined stroke, a push rod pivotally connected to said slack arm by a first pivot connection for moving said slack arm through said predetermined stroke, abutment means pivotally connected to said push rod by a second pivot connection spaced beyond said first pivot connection between said push rod and slack arm, said second pivot connection during rotatable movement of said slack arm being movable about said first pivot connection to impart generally reciprocating movement to said abutment means relative to said carrier, and said carrier having a carrier abutment cooperating with said abutment means upon movement of said slack arm and ratchet wheel beyond said predetermined stroke toward an overtravel position for stopping rotation of said pawl carrier beyond said predetermined stroke while effecting rotational movement of said slack arm and ratchet wheel in one direction relative to said pawl carrier as said slack arm and ratchet wheel rotate past said predetermined stroke toward said overtravel position, and said carrier abutment cooperating with said abutment means upon return of said slack arm from said overtravel position toward said brake released position for stopping rotation of both said pawl carrier and ratchet wheel before said slack arm reaches said brake released position while effecting rotational movement of said slack arm opposite to said one direction relative to both said ratchet wheel and pawl carrier as said slack arm continues rotation toward said brake released position to adjust the slack in said mechanism and limit the travel of said slack arm to said predetermined stroke.

4,150,736

WHEEL BRAKE ASSEMBLY

Milford F. Marti, 608 B Chateau Dr., Huntsville, Ala. 35802

Continuation of Ser. No. 638,594, Dec. 12, 1975, abandoned, which is a continuation of Ser. No. 444,736, Feb. 22, 1974, abandoned. This application May 12, 1977, Ser. No. 796,346
Int. Cl.[2] F16D *51/22, 65/08*
U.S. Cl. 188—332 **13 Claims**



1. A wheel brake assembly adapted to be employed with an automotive drum comprising:

a pair of brake shoes, each having an arcuately-shaped outer lining bearing portion adapted to engage the inner peripheral wall of said drum and an inner web perpendicular to said lining bearing portion;

a pair of discrete, spaced, parallel, flat plates, each having an inner and facing flat guide surface dimensioned to guidably engage webs of said brake shoes, said facing flat guide surfaces of said plates being coextensive with each other and with said webs in regions corresponding to circumferential mid regions of said webs, said plates having like positioned openings open at their inner edge regions, and thus configured to slip, normally, over an axle and to separately attach to an axle assembly;

a plurality of relatively small spaced connectors extending between and ridigly connecting and spacing said plates apart, said connectors being substantially spaced outward from said circular inner edge region, and at least one of said connectors being located adjacent to each of said mid regions, whereby the inner surface of said plates is held for radially guiding said webs of said brake shoes in said mid regions, and thus assuring uniform engagement of said shoes with said drum;

anchor surfaces and spring bias means connected to said brake shoes for normally biasing said brake shoes against anchor surfaces and said lining bearing portion of said brake shoes in a contracted position wherein said lining

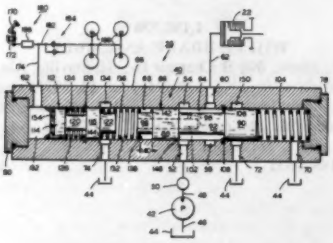
bearing portions are normally withdrawn from engagement with said inner peripheral wall of said drum, said spring bias means comprising a pair of springs interconnecting the webs of said brake shoes, a first spring extending over and across an outer surface of one of said plates, and a second spring extending over and across an outer surface of the other plate and parallel to said first spring; and brake actuating means for applying a braking force to at least one of said shoes, whereupon said lining bearing portion of a said shoe is forced into engagement with said drum.

4,150,737

INCHING VALVE

Jon R. Patton, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 3, 1977, Ser. No. 821,277
Int. Cl.[2] B60K *41/24;* F16D *67/02*
U.S. Cl. 192—13 R **15 Claims**



1. In a control apparatus for a vehicle having a transmission and including brake means comprising hydraulic passage means connecting a source of fluid pressure to a fluid pressure actuated clutch, an improved inching valve interposed in said hydraulic passage means for selectively manually reducing the hydraulic pressure supplied to said clutch in proportion to the degree of actuation of said brake means, said improved inching valve comprising:

a. an elongated valve body having a through bore with first and second closed ends, said body having an inlet port, an outlet port and multiple drain ports, with all of said ports communicating with said through bore;

b. a spool member sealingly and slidingly retained within said bore, said spool member including first and second land portions separated by an annular groove portion in constant communication with said outlet port, said spool member further including a passageway through said second land portion and restriction means in constant communication with said passageway and said annular groove portion;

c. first resilient means between said first closed end and said spool first land portion for biasing said spool member to a first position with an effort equivalent to a maximum desired clutch slip pressure, said through bore also including first stop means for limiting, in one direction, the movement of said spool member to said first position;

d. actuating means sealingly and slidingly retained within said through bore and axially spaced from said spool member;

e. second resilient means within said through bore for biasing said actuating means to a first position, said through bore further including second stop means for limiting, in another direction, the movement of said actuating means to said first position;

f. a variable volume chamber between said spool member second land portion and one end of said actuating means, said variable volume chamber being in full communication with a first drain port when said actuating means is in its first position, said variable volume chamber also being in constant communication with said spool member passageway, said variable volume chamber further containing third resilient means between said spool member and said actuating means, with the axial extent of said third resilient means being less than the axial extent of said variable volume chamber when said spool member and said actuating means are in their first position; and

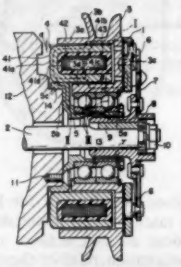
g. said actuating means being operatively connected with said brake means, for initially, in a first stage, overcoming said second resilient means and moving said actuating means to a second position wherein the one end of said actuating means closes off said first drain port thereby causing a build-up of pressure within said variable volume chamber until said pressure exceeds the force of said first resilient means and causes movement of said spool member to a second position wherein said second land portion completely closes off said inlet port, with said spool member and said first resilient means thereafter controlling the pressure to said clutch to permit inching of said vehicle, whereby the solely hydraulical connection between said actuating means and said spool member positively restricts the operation of said improved inching valve to pressures below said maximum desired clutch slip pressure.

4,150,738

ELECTROMAGNETIC CLUTCH

Kosaku Sayo, Katsuta; Seijiro Tani, Naka, and Atsushi Suginuma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 8, 1976, Ser. No. 748,503
Claims priority, application Japan, Dec. 8, 1976, 50-145088
Int. Cl.[2] F16D *27/06*
U.S. Cl. 192—84 C **16 Claims**



15. An electromagnetic clutch comprising:

clutch disc means connected to a rotary shaft;

a rotor having a pole face, and inner walls defining an annular cavity therein, said rotor being supported coaxially about said shaft;

an annular one piece core member disposed about said shaft in said annular cavity;

an excitor supported on said core member within said annular cavity;

an annular one-piece supporting member for supporting said rotor for relative rotation therebetween said supporting member being secured within said core member; and

wherein said annular support member is formed of a non-magnetizable material.

4,150,739
ADJUSTABLE FRICTION CLUTCH FOR PRESSES

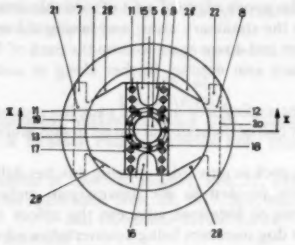
Helmut Dischler, Neuss; Eduard Huydts, Dusseldorf, and Gert Lohmann, Neuss, all of Fed. Rep. of Germany, assignors to Firma G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,565

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650881; Oct. 7, 1977, 2745142

Int. Cl.[2] F16D *13/40, 13/68, 69/00*

U.S. Cl. 192—107 R **21 Claims**



1. In a friction clutch of the type comprising a pair of rotatable, coaxial, annular, spaced drive members, at least one of the drive members being axially movable, an off-drive shaft mounted coaxially with the drive members, a spring plate having friction coatings along its outer edges, and clamping means securing the spring plate at its center to the off-drive shaft, the said outer edge friction coatings of the spring plate being disposed in the space between the drive members so that, upon movement of said one of the drive members axially toward the other to activate and engage the clutch, the said outer edges and friction coatings are clamped between the drive members, elastically deforming the spring plate, the improvements wherein said friction coatings are so arranged on the spring plate that their inside edges, facing toward the off-drive shaft, extend along straight lines that are perpendicular to a radius starting from the center of said off-drive shaft, and said clamping means extends outwardly from the off-drive shaft and terminates along straight lines which are parallel to said lines of the inside edges of the friction coatings, thus causing uniform bending of the spring plate and preventing spherical deformation because of the annular shape of the drive members.

4,150,740
MONEY EXCHANGING SYSTEM

Syugo Douno, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Continuation-in-part of Ser. No. 680,522, Apr. 26, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,324

Claims priority, application Japan, May 2, 1975, 50-53626

Int. Cl.[2] G07F *7/04*

U.S. Cl. 194—4 C **1 Claim**

1. A money changing system comprising:

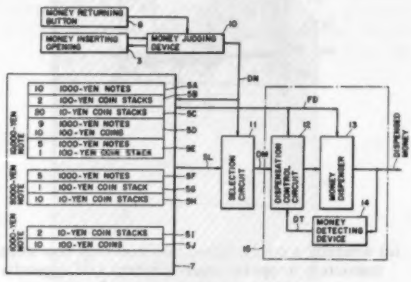
(a) money judging means for judging whether or not a piece of money having one of a plurality of different denominations and inserted into said system for being changed is acceptable;

(b) exchange operation setting means having manually actuable selecting means for selecting any one of a plurality of groups of money for each denomination piece of money to be changed, each group consisting of money of a single or a plurality of denominations and in each said group the total value of the money being equal to the value of the denomination of the corresponding piece of money to be changed, and said exchange operation setting means being coupled to said money judging means for producing, in response to an indication that a piece of money inserted into said system has been judged acceptable, a selection signal corresponding to one of said groups of money in response to a manual selection by the user of the system;

(c) selection means coupled to said money judging means and said exchange operation setting means for receiving said selection signal and producing a money dispensing signal representative of a group of money which has been manually selected in response thereto;

(d) a money dispensing means for dispensing money of the selected group in response to said money dispensing signal;

(e) money detecting means coupled to said money dispensing means for detecting the amounts of money dispensed by said money dispensing means and producing a detection signal; and



(f) dispensation control means coupled between said selection means and said money dispensing means and to which the output of said money detecting means is coupled and for causing said money dispensing means to dispense money on receipt of said money dispensing signal, and for counting the detection signals produced by said money detecting means, and when a monetary value corresponding to said money dispensing signal coincides with the monetary value counted by said detection signals, for suspending the money dispensing operation of said money dispensing means,

whereby a user can selectively designate a desired one out of the plurality of groups of money to be received as change for a piece of money, and as a result of such designation the selected group of money is dispensed.

4,150,741
COIN-OPERATED APPARATUS FOR CUTTING PRODUCT UNITS FROM A STRIP THEREOF

Gino Rubin, Via Boncompagni 55, Milan, Italy

Filed Apr. 25, 1977, Ser. No. 790,733

Claims priority, application Italy, Sep. 15, 1976, 27214/76

Int. Cl.[2] G07F *5/00, 11/72*

U.S. Cl. 194—79 **7 Claims**

1. An apparatus for cutting product units from a strip, wherein said product units are packaged in individual containers connected together to form a strip, and cutting each individual product unit from the strip which is fed stepwise to bring each terminal product unit into a cutting position during each distribution cycle, comprising, in combination,

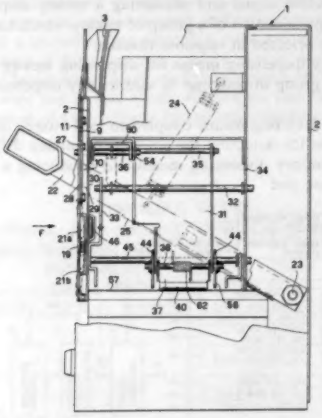
(a) a coin box for insertion therein of a suitable coin, said coin box comprising a coin chute with a restriction defined by an appendix;

(b) a cutting mechanism for separating said terminal product unit from said strip, said cutting mechanism being actuated by insertion of said coin in said coin box;

(c) a latch element movable between a first position in which operation of said cutting mechanism is prevented and a second position in which said operation is permitted, said appendix being connected operationally to said latch element;

(d) a feed mechanism for stepwise feeding of said strip so as

to bring the next product unit into a position suitable for cutting, and ready for a further operating cycle, said feed mechanism being actuated by the return to rest position of said cutting mechanism;



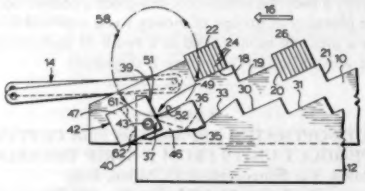
(e) whereby a coin inserted into said coin box stops at said restriction to operationally connect said appendix to said cutting mechanism, the operation of said cutting mechanism causing said latch element to move into said second position.

4,150,742

IMBRICATING A GROUP OF FLAT BARS

Edwin R. Pretsch, and Jan Cipris, both of Hamilton, Canada, assignors to The Steel Company of Canada, Limited, Hamilton, Canada

Filed Jan. 11, 1978, Ser. No. 868,524
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—459 **6 Claims**



1. In an appartus for transferring packs of elongated flat bars in a given direction normal to their length, the apparatus including: a first set of similar stationary arms transverse to the bar length with notched upper edges for receiving the packs leaning in the given direction, a second set of similar movable arms interposed between adjacent stationary arms with notched upper edges matching the upper edges of the stationary arms, means for moving the movable arms in a closed loop, and shuffle bar means beyond the arms in said given direction, the improvement which comprises:

a modified notch at the downstream end of all of said movable arms, including a dog member on at least some of said movable arms defining a notch and pivoted to its respective arm adjacent the apex of the notch, the dog member being counterbalanced to retain the dog member with its notch oriented the same as the other notches of the arm so long as no flat bars are supported in the notch, but to allow the dog member to pivot when a pack of flat bars is supported in the dog member notch, the pivoting causing the bars to lean in the direction opposite said given direction, movement of said movable arms in said closed loop being adapted to pick up, in the dog member notches, a pack of flat bars leaning in said given direction, to pivot the bars to lean in the other direction, and to set the bars down on the shuffle bar means.

6. A method of transferring packs of elongated flat bars in a given direction normal to their length, comprising:

transferring each pack of flat bars, the latter leaning in said given direction, in stepwise fashion along a series of upwardly opening notches in the upper edges of a set of stationary arms arranged transversely to the longitudinal extent of the bars, by picking up each pack with similar notches in the upper edges of a set of movable arms interleaved with the stationary arms; and raising the movable arms up, over and down again to drop the pack of flat bars into stationary arm notches further along in said given direction,

repeating the preceding step until the pack has moved to the downstream end of the stationary arms in said given direction,

picking up the pack in upwardly opening notches defined by dog members pivoted to the downstream ends of the movable arms at locations adjacent the apices of their notches, the dog members being counterbalanced so as to keep their notches upright when no pack is received therein, but so as to tilt their notches toward the upstream direction when weighted by receiving a pack,

allowing the dog members to tilt toward the upstream direction to cause the flat bars to lean oppositely to said given direction, while lifting the pack up, over and down at a location further in said given direction,

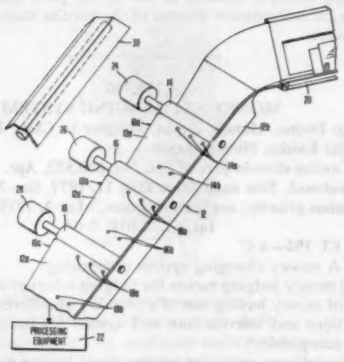
and depositing the pack, still leaning oppositely to said given direction, onto shuffle bar means downstream of said arms.

4,150,743

SINGULATION DEVICE FOR MAIL

Sebastian J. Lazzarotti; Robert S. Bradshaw, both of Broomall, and James R. Hunter, Chadds Ford, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,384
Int. Cl.[2] B65G *47/30*
U.S. Cl. 198—460 **10 Claims**



1. A singulation device for mixed mail pieces comprising in combination:

a singulator slide for receiving said mail pieces, said slide having a backplate and a single registration wall along a side thereof,

a plurality of spaced-apart singulating stations disposed along said slide, each of said stations including a friction roller and a pair of document sensing means associated therewith, said sensing means being positioned at a pair of

respective locations displaced from each other along the length of said slide downstream from said roller,

said singulator slide having a compound slope wherein its longitudinal axis is inclined with respect to the horizontal and its transverse axis is further inclined from the horizontal in the direction of said registration wall, said compound slope enhancing the gravitational forces acting upon said mail pieces to guide them down the slide with one common side edge registration,

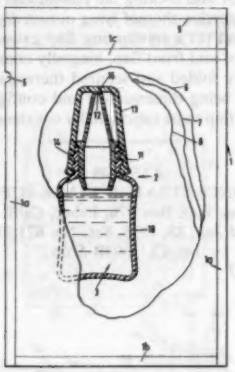
logic control means responsive to each pair of document sensing means of the respective singulation stations for independently controlling the rotation of the roller associated therewith, thereby achieving progressive separation of said mail pieces.

4,150,744

PACKAGING

Jack Fennimore, Welwyn Garden City, England, assignor to Smith & Nephew Pharmaceuticals Ltd., Hertfordshire, England

Continuation of Ser. No. 662,031, Feb. 27, 1976, abandoned.
This application Nov. 23, 1977, Ser. No. 854,349
Int. Cl.[2] B65D *81/24, 83/14*
U.S. Cl. 206—205 **5 Claims**



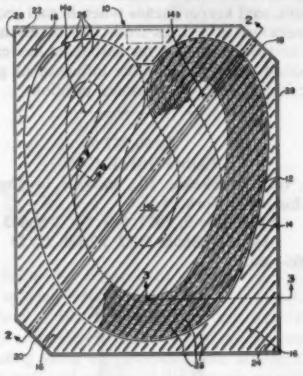
1. A packaged medicant comprising (1) an outer hermetically sealed envelope, (2) an inner dispenser bottle, and (3) an inert atmosphere within the envelope within which the dispenser bottle is immersed; said hermetically sealed envelope comprising a three-ply laminate wherein the outer ply is an abrasive-resistant polymer, an intermediate ply which is aluminum foil, and an inner ply which is a heat-sealable polymer, said three-ply laminate in combination excluding entry of oxygen and light and preventing escape of water vapor and the inert atmosphere; said inert atmosphere within the envelope being oxygen; free; and said dispensing bottle being a translucent polymer and containing a solution of light-sensitive, oxygensensitive medicant and an anti-oxident and comprising a receptacle for holding a predetermined quantity of the liquid medicant provided with a neck defining an opening to the interior of the receptacle, a discharge element comprising a cylindrical part press-fitted into the opening in the neck, a tapered nozzle through which the liquid medicant in the receptacle is adapted to be dispensed in predetermined doses, and an annular, externally-located collar in conjunction with the cylindrical part and the tapered nozzle for seating of the discharge element within the neck, said tapered nozzle terminating in an end opening of a diameter to dispense said predetermined dose and said receptacle having elastically flexible walls such as to enable squeezing the walls to displace a dose through the opening at the end of said tapered nozzle, a closure cap arranged to be releasably applied to the neck over the tapered nozzle and a sealing element interiorly of the cap arranged to become engaged with the opening at the end of the nozzle when the cap is applied to the neck to provide a leak-tight barrier between the opening and the interior of the cap.

4,150,745

BELT PACKAGING TRAY

Larry J. Williams, Waverly, and Alvin A. Brhel, Lincoln, both of Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 3, 1978, Ser. No. 892,547
Int. Cl.[2] B65D *85/02, 1/34, 81/16, 85/62*
U.S. Cl. 206—303 **10 Claims**



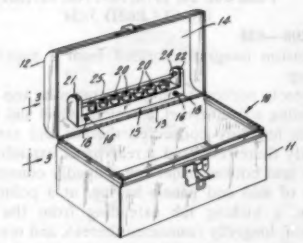
1. A packaging tray comprising a vacuum molded polystyrene carrier having a raised land area and a recessed well area, the land area defining the shape of the tray and the configuration of the well, said well being substantially heart-shaped to receive a plurality of flexible endless belts in a looped configuration therein with the ends of the loop being retained in lobe portions of the heart shape and maintaining said belts in a nested orientation therein, the depth of the well being slightly less than the transverse width of a belt so that when trays of belts are vertically stacked the belts within the tray well are maintained in their nested orientation by the bottom of the tray above it, the gauge of the carrier being within the range of 5–30 mils and having at least two corners truncated such as to provide hand-hold positions in the handling of the tray.

4,150,746

TOOL BOX APPLIANCE

Victor A. Buglione, 106-16 75th St., Jamaica, N.Y. 11417

Filed Oct. 19, 1977, Ser. No. 843,636
Int. Cl.[2] B65D *85/20*
U.S. Cl. 206—372 **10 Claims**



1. A case including a box having an open top, a cover for closing said top, means pivotally mounting said cover to said box for movement between a closed and an open position

wherein a main section of said cover is respectively generally horizontal and generally vertical, a holder mounted to said cover in fixed position on the inside thereof, said holder having recess means for storage of articles therein, with said cover in said open position said recess means being operatively positioned for insertion and removal of articles through opening means at the top of said recess means, with said cover in said closed position said recess means being operatively positioned so that said opening means is at a side of said recess means, keeper means operatively connected to said cover for movement between first and second positions with respect to said cover means, said keeper means when in said first position permitting articles to be inserted and withdrawn from said recess means, said keeper means when in said second position blocking removal of articles from said recess means, means mounting said keeper means for automatic movement thereof to said second position under the influence of gravity when said cover is operated to said closed position.

4,150,747

COMPOSITE CAN

Gerald A. Gordon, Skokie, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed May 9, 1977, Ser. No. 794,883
Int. Cl.[2] B65D *5/72, 17/02, 17/16*
U.S. Cl. 206—603 **19 Claims**

1. A container comprising a rigid cylindrical sidewall, defined about a principal axis, an end closure integrally attached to said sidewall, a product compatible liner disposed within said sidewall, and movable rupturing means pivotally mounted on said sidewall and swingable away from said sidewall into rupturing contact with said liner for rupturing said liner to permit passage of product therethrough, and a manually operable flexible pull member attached to said rupturing means for swinging the same.

4,150,748

TAMPERPROOF RECLOSABLE CARTON

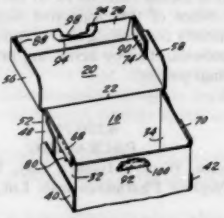
David C. Mueller, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jul. 24, 1978, Ser. No. 927,561
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—624 **8 Claims**

1. A carton integrally formed from a paperboard blank comprising:

a receptacle portion having a rectangular top opening and including a front panel, a bottom panel and a pair of end panels hingedly connected thereto and extending rearwardly therefrom, and a rear panel extending upwardly from said bottom panel and hingedly connected thereto, each of said end panels having, at a point adjacent its hinge, a locking tab extending from the upper edge thereof, hingedly connected thereto, and reversely folded to lie thereagainst, said tab having a transversely extending line of weakness located outwardly of said hinge connection thereof; and

a cover portion, including a top panel hingedly connected to the upper edge of said rear panel of said receptacle portion and dimensioned and configured to overlie and close the opening thereof, and a relatively narrow skirt member, comprised of: (a) a front flap hingedly connected to and depending from the forward edge of said top panel and extending entirely across said front panel of said receptacle portion, (b) a pair of end tabs hingedly connected to the ends of said front flap with each of said end tabs extending rearwardly therefrom over the corresponding one of said end panels of said receptacle portion, with said



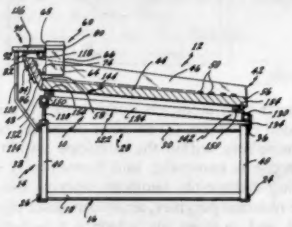
corresponding locking tab thereof interposed therebetween and secured to said corresponding end tab, the securement of said locking tab to said end tab being confined to the portion thereof lying outwardly of said line of weakness, and (c) a reinforcing flap extending from the lower edge of said front flap, hingedly connected thereto, and reversely folded and secured thereagainst, said reinforcing flap being dimensioned and configured similarly to said front flap to be substantially coextensive therewith.

4,150,749

ORE CONCENTRATOR TABLE SUPPORT

Walter W. Stevens, P.O. Box 476, Lebec, Calif. 93243

Filed Jan. 23, 1978, Ser. No. 871,210
Int. Cl.[2] B03B *5/06*
U.S. Cl. 209—437 **1 Claim**



1. An ore concentrator, comprising:

a base having a major axis;

a riffle table including a floor, a front wall, a side wall extending upwardly and outwardly from said floor and forming an angle of approximately 135 degrees therewith and a discharge end, said floor having a plurality of riffles provided thereon in parallel, spaced-apart relation;

a pair of support members each having first and second edge portions;

a hinge swingably connecting one of said edge portions of each of said support members to said base in spaced-apart relation along a line parallel to its major axis;

a threaded member adjustably supporting the other of said edge portions of each of said support members on said base in a manner such that said other edge portions of said support members may be supported by said base at elevations exceeding the elevation of each of said one edge portions of said support members;

a plurality of ball bearings reciprocably coupling said riffle table to said edge portions of said support members in a

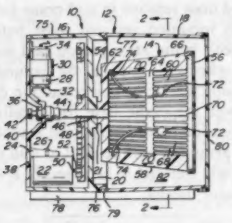
manner such that the longitudinal edge portions of said riffle table will remain parallel to said first and second edge portions of said support members during reciprocation of said riffle table regardless of the amount of inclination imparted to said riffle table about its major axis by said threaded members; and

a stationary water distribution system including a conduit solely supported by said base adjacent said side wall in a position such that water discharging from said conduit will flow down said side wall and onto said floor, said conduit being provided with a plurality of water-outlet apertures spaced uniformly along said conduit from said front wall to said discharge end of said table, said water distribution system also including an arcuate band frictionally engaging said conduit over each aperture, each of said bands including an edge portion adapted to regulate flow of water through its associated aperture when rotated to a predetermined position on said conduit.

4,150,750
APPARATUS FOR PROCESSING VEGETABLE MATERIAL

Herbert Sawasky, Massapequa, N.Y., assignor to Heads Up Enterprises, Yonkers, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,794
Int. Cl.[2] B07B *1/24*; B02C *17/10*
U.S. Cl. 209—664 **11 Claims**



1. Apparatus for separating seeds and twigs from vegetable material comprising:

an outer container;

said outer container being divided into a first portion and a second portion;

a wall member separating said first portion from said second portion;

said wall member being attached to said first portion; motor means disposed within said first portion; an inner container disposed within said second portion;

a rotatable shaft passing through a hole in said wall member and extending on either side of said wall member into said first and second portions;

said inner container being secured to said rotatable shaft for rotation therewith;

means drivingly coupling said rotatable shaft to said motor means;

said inner container having one end secured to said rotatable shaft, a generally cylindrical body section and a removable top forming the other end whereby with said top removed, the vegetable material to be processed may be placed within said inner container;

said body section being comprised of a plurality of spaced and interconnected slat members;

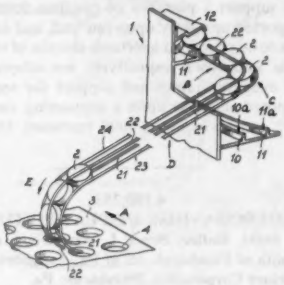
a collection chamber formed by the space between the outer surface of said inner container and the inner surface of said second portion whereby upon rotation of said inner container the usable vegetable material is separated from the seeds and twigs and passes into said collection chamber; and

means for gaining access to said collection chamber.

4,150,751
TABLET FEEDER FOR FILLING HONEYCOMB-LIKE CELLS OF A TAPE

Andrea Romagnoli, via Madonna dei Boschi, 18, S. Lazzaro Di Savena, Bologna, Italy

Filed Oct. 17, 1977, Ser. No. 843,093
Claims priority, application Italy, Oct. 20, 1976, 3569 A/76
Int. Cl.[2] B07C *5/12*
U.S. Cl. 209—682 **7 Claims**

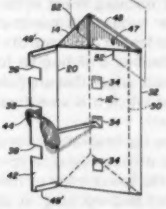


1. A tablet feeder for filling cells arranged in longitudinal rows in a belt moving forward continuously, characterized in that it comprises: a tablet container having a vertical axis cylindrical wall and a slightly convex base, at least one bracket member extending along a cylindrical helix around the inner surface of said wall and resting at the bottom on said base; a vibrating means associated with said container and being effective to cause at least one such row of tablets to climb up along said bracket member, at least one tablet guiding tubular duct extending obliquely from the top end of said bracket member downwardly, and having an upper tablet inlet mouth in alignment with said bracket member to receive the tablets and a lower tablet outlet mouth substantially orthogonal with respect to the belt direction of advance, said lower mouth being aligned with the cells of a longitudinal row to be filled, each tablet being urged into a respective empty cell by the tablets following it.

4,150,752
DISPLAY RACK FOR EYEGLASSES

Grant F. Breining, York, and Ronald C. Webb, Red Lion, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed May 15, 1978, Ser. No. 905,836
Int. Cl.[2] A47F *7/02*
U.S. Cl. 211—13 **9 Claims**



1. A multi-position display rack for holding a plurality of eyeglasses of the type having temples and comprising in combination, a supporting frame of triangular configuration in cross-section composed of two similar panels of relatively rigid material disposed at an acute angle to each other and similar edges thereof engaging each other, a stiff rib connected to and

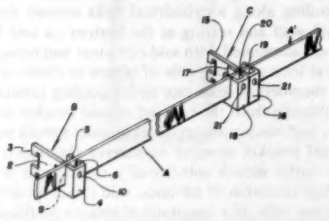
extending along said similar edges and projecting outwardly from the junction thereof within a plane substantially bisecting said angle and said rib having a plurality of notches formed in the outer edge thereof in longitudinally spaced relationship to each other and adapted to receive the nose bridges of eyeglass frames, and a third panel of material similar to and extending between and connected to the edges of said similar panels which are opposite said engaged edges, said similar panels each having a similar row of temple-receiving apertures therein spaced apart similarly to the spacing of said notches in said rib, thereby to support a plurality of eyeglass frames when said rack is supported uprightly upon one end, and said third panel having two rows of spaced apertures therein of which opposite apertures in said rows respectively are adapted to receive temples of eyeglass frames and support the same when said rack is disposed sidewise upon a supporting surface and said third panel extends upward and rearward from one edge thereof.

4,150,753

MERCHANDISE DISPLAY FIXTURE

Charles J. Stahl, Butler; Bruce L. Armstrong, and David M. Moore, both of Pittsburgh, all of Pa., assignors to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1978, Ser. No. 893,773
Int. Cl.[2] A47H *1/02*
U.S. Cl. 211—105.1 **6 Claims**



1. A merchandise supporting and display fixture having a horizontal bar extending between and supported by spaced brackets, the bar being of a noncircular transverse section with flat side faces between its top and bottom edges, the invention comprising a supporting bracket comprising:

a. a forwardly extending generally horizontal arm having an inner end portion for attaching it to a vertical supporting means and an outer end portion;

b. said outer end portion having a terminal web extending transversely to the arm and with a reverse wing portion thereon turned toward the inner end of the arm;

c. the arm having an opening therethrough transverse to the vertical plane of the arm spaced inwardly from said web, the top of said opening being open to receive the lower edge of the bar when said bar is entered in a direction transverse to its length downwardly into said opening and of a shape providing a sliding fit to receive the bar and with opposite side edges that are parallel with the flat side faces of the bar when it is so entered to the full depth of the opening; and

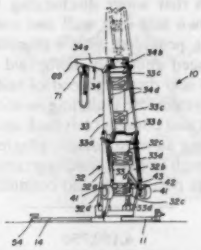
d. a cam means on the bracket at a level below the top of the opening where it is arranged to resist the entrance of the bar only after the lower edge of the bar is first entered in the open top of said opening in the manner defined in paragraph (c) and thereafter yieldingly exert pressure transverse to the length of the bar against one of said flat side faces of the bar to urge the other flat face into firm contact with the opposite edge of the opening, and restrain the bar against rotational movement about its axis, said reversely turned wing providing a second edge against which a flat surface of the bar is also frictionally urged by said cam.

4,150,754

UTILITY CRANE

Marvin G. Schmitt, Fountain Valley, Calif., assignor to AMI Industries, Inc., Downey, Calif.

Filed May 23, 1977, Ser. No. 799,223
Int. Cl.[2] B60P *1/00, 3/12*
U.S. Cl. 212—8 R **18 Claims**



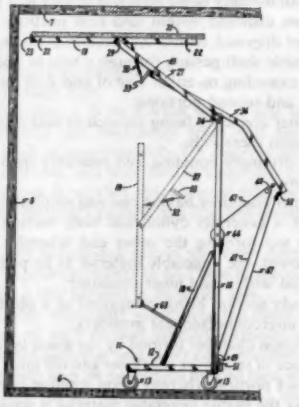
1. A mobile crane comprising a generally horizontal base having at one end coupling means for engagement with a vehicle, a mast carried on said crane base, means for pivotally supporting said mast on said crane base for movement of a free end thereof in a vertical plane between a retracted position and an extended position, actuator means operably connected between said crane base and said mast for controllably raising and lowering said mast relative to said crane base, and a pair of transport wheels mounted on said mast between the ends thereof, said wheels being arranged on said mast in a manner permitting said wheels to engage the ground and raise the crane base for road clearance upon retraction of said mast, and alternatively lower the crane base for stabilization with the ground upon extension of said mast, said actuator means being constructed and arranged with respect to said mast to permit a load attached to said free end to be raised or lowered by operation of said actuator means.

4,150,755

PANEL PLACING DEVICE

Lowell C. Trott, P.O. Box 625, Trinidad, Calif. 95570, and Albert E. Hall, 8885 Halvorson Dr., Elk Grove, Calif. 95624

Filed Jan. 19, 1978, Ser. No. 870,609
Int. Cl.[2] B66F *11/00*
U.S. Cl. 414—11 **8 Claims**



1. A device for use in placing a panel against an abutment comprising a carriage frame including a pair of uprights, a pair of links, means for pivoting said links on said uprights for

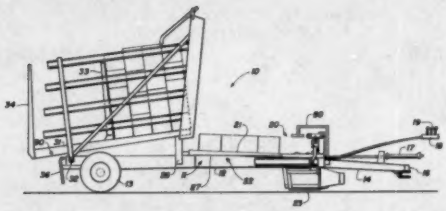
rotation about a first axis, a panel frame, means for pivoting said panel frame on said links for rotation about a second axis, means interconnecting said links and said carriage frame for rotating said links relative to said carriage frame, said interconnecting means including a lever, and means for mounting said lever on said carriage frame for rotation about a third axis parallel to said first axis and said second axis to move into engagement with and to rotate said links.

4,150,756

BALE WAGON

L. Dennis Butler, Kingsbury, Calif., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 30, 1978, Ser. No. 891,890
Int. Cl.[2] A01D *87/12;* **B65G** *57/32*
U.S. Cl. 414—40 **8 Claims**



1. In a bale wagon having a mobile chassis and means mounted on said chassis defining a bale-supporting area, the improvement comprising:

bale-receiving means on said chassis including a fixed table generally in the same horizontal plane as said bale-supporting area and adapted to receive at least one bale on a first one of its sides, said fixed table having a length and a width extending between a first edge adjacent said bale-supporting area and an opposing second edge;

a pusher means including a bale-engaging member extending substantially the length of said fixed table and mounted for selective movement in a first direction from said second edge of said fixed table toward said bale-supporting area and a second opposite direction to engage the lowermost portion of any bale on said fixed table;

bale-turning means on said chassis for substantial simultaneous interaction upon a bale with said pusher means when moving in said second direction, said bale-turning means including a vertically pivotable substantially horizontal arm member above said fixed table positioned to engage the uppermost portion of any bale, on the side opposite said side bale-engaging member, on said fixed table during the movement of said pusher means in said second direction; and

control means for selective determination of the movement of said bale-engaging member.

4,150,757

PLURAL DOCUMENT STACKING AND SUBSEQUENT SELECTIVE STACK TRANSPORTING APPARATUS

Robert J. Laybourn, San Jose, and John J. Lynott, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

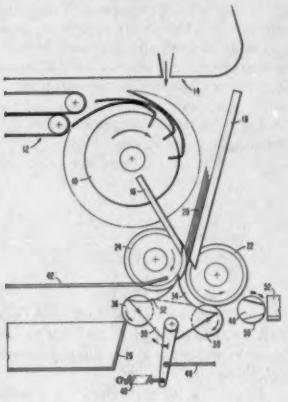
Filed Jan. 23, 1978, Ser. No. 871,569
Int. Cl.[2] B31B *1/98;* **B65H** *29/60, 33/14*
U.S. Cl. 414—107 **10 Claims**

1. Plural document stacking and selective stack transporting apparatus, comprising,

a pair of intermittantly driven members arranged for blocking said documents when idle and for passing a stack of said documents therebetween when driven,

a back plate arranged with respect to said members for assembling a stack of said documents with one edge resting on at least one of said members

mechanism arranged with respect to said back plate for depositing documents onto said one member, and



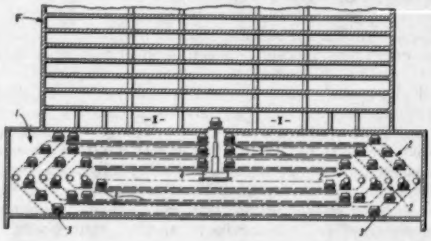
drive mechanism for driving said members and transporting said stack of documents therebetween.

4,150,758

APPARATUS FOR STOWING AND CONVEYING ARTICLES, PARTICULARLY FOR USE IN PARKING MOTOR VEHICLES

Carlo Mascherpa, Corso Sempione 11, 20145 Milan, Italy

Filed Nov. 29, 1976, Ser. No. 745,599
Claims priority, application Italy, Dec. 1, 1975, 29863 A/75
Int. Cl.[2] B65G *106*
U.S. Cl. 414—282 **1 Claim**



1. An apparatus for stowing and conveying articles comprising at least one plurality of supporting and conveying units mutually interconnected at predetermined intervals, movable in continuously horizontal positions on an endless runway formed by fixed tracks for guiding the supporting members of said units, continuity of support by said tracks and by auxiliary fixed means associated therewith being provided for the supporting and conveying units through the whole runway, the means for interconnecting the units also serving to produce the control movements, said apparatus being characterized in that it comprises pluralities of supporting units in side-by-side horizontal arrangement and in overlying vertical arrangement, the transfer of the individual loads from the supporting units of each plurality to the loading and unloading level and vice-versa, being effected at the horizontal ends of the endless runway of the supporting units by transelevators, each said transelevator comprising an upright containing tower structure carrying cables running along the uprights and an electric reduction motor which drives said cables, said transelevator movable along the direction in which the pluralities of supporting units are arranged side by side, and a transfer platform

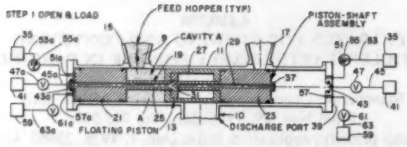
movable vertically by said cables and motor and simultaneously reciprocally from one side of said tower structure to the other side of said tower structure in the direction in which said pluralities of supporting units are arranged side-by-side and in the vertical direction, said platform comprising a roller carpet, the rollers of which are mounted idle on a pair of lateral box members; a pair of half-box members, in which said box members may slide and which are in turn movable in respect of a pair of half-box members, fixed to the uprights of the tower structure of the transelevator; a reduction motor with a shaft provided with gear wheels; and racks carried by said box members, by said first half-box members and by said carpet, to provide controlled movements of the platform translating parallel to itself, without the need for gears and/or transmission between various platform elements, said roller carpet comprising a reinforced region acting as a loading floor, and wherein the loads are carried on said floor by loading plates provided with feet.

4,150,759

SOLIDS FEEDER APPARATUS

Harold S. Bell, Jr., Madison, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 1, 1977, Ser. No. 856,365
Int. Cl.² C10J *3/30*
U.S. Cl. 214—187 **8 Claims**



1. Apparatus for feeding coal into a high pressure gasifier, comprising:

a. a high pressure gasifier containing a high pressure gas and having a longitudinally extending housing means forming a cylindrical inside surface, spaced apart inlet ports, and an outlet port disposed between the inlet ports for filling the gasifier with coal;

b. shaft assembly means forming oppositely directed axial passages having two first pistons in slidably sealing contact with the inside surface of the housing means and a shaft that separates the two first pistons at a fixed distance apart to form a longitudinally extending carrier defining a longitudinally extending, cylindrical, coal accepting cavity therebetween that is in communication with the opposite ends of the housing means through the respective passages;

c. means having an actuation fluid and first valves for selectively oppositely introducing and removing the fluid from the opposite ends of the housing means to bias the two first pistons back and forth in the housing means for alternately sequentially opening and closing the cavity from communication with the respective inlet ports for loading the gasifier with coal by alternately sequentially receiving and transporting the coal from the respective inlet ports to the outlet port; and

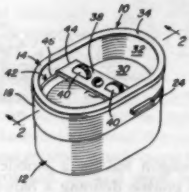
d. second floating piston means in the housing means in slidably sealing contact with the inside surface thereof having means for pressurizing a portion of the cavity through the passages in accordance with the position of the two first pistons for alternately selectively biasing the floating piston means back and forth in slidably sealing contact with the inside of the housing means on opposite sides of the cavity in accordance with the direction of the pressurization of the cavity through the passages for alternately selectively closing the cavity from communication with one inlet port while one of the two first pistons closes the other inlet port from communication with the cavity, and for closing the cavity from communication with the outlet port when the cavity communicates with one of the inlet ports, so that the cavity is closed from communication with both of the inlet ports when the cavity communicates with the outlet port to load coal into the gasifier, and the gasifier is closed from communication with the inlet ports through the cavity when the cavity is closed from communication with the two inlet ports by one of the first two pistons and the second piston means respectively so as to prevent the escape of high pressure gas from the gasifier during the loading of the coal into cavity and from the cavity into the gasifier.

4,150,760

CHILDPROOF ENCLOSURE

Henri Y. d'Orgelys, 3936 San Clerc Rd., Jacksonville, Fla. 32217

Filed Aug. 18, 1978, Ser. No. 934,693
Int. Cl.² B65D *51/12*
U.S. Cl. 215—213 **8 Claims**



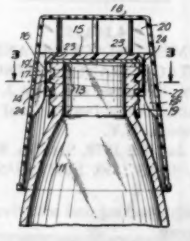
1. An enclosure for preventing access to the interior thereof by small children while readily allowing such access by adults comprising: a base having a longitudinal dimension and a lateral dimension with the longitudinal dimension being greater than the lateral dimension, a perimetric wall with at least one circumferentially extending slot in said wall, the slot having one area of greater thickness than the remainder of the slot; a cap for acceptance into said base, the cap having a locking means comprising a longitudinally extending locking bar rotatably mounted on the cap, said locking bar being insertable into said slot upon rotation thereof and being biased into said area of greater thickness upon contact therewith such that rotation of said locking bar is inhibited due to the contact with the enlarged area.

4,150,761

BOTTLE CLOSURE-CUP ASSEMBLY

Herbert Collins, Fort Lee, N.J., assignor to Schenley Industries, Inc., New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,345
Int. Cl.² B65D *51/24*
U.S. Cl. 215—228 **11 Claims**



1. A bottle closure-cup assembly comprising a rotatably removable bottle cap and a cup formed with a base, a rim, a rigid peripheral wall extending continuously from said base to

said rim and inwardly projecting means for engaging with said bottle cap, said bottle cap formed with coupling means formed on the outer peripheral surface thereof for coupling engagement with said projecting means, the peripheral wall of said cup being spaced apart from said bottle cap when in said coupling engagement for defining a cup of a volumetric dimension substantially greater than said cap, whereby said cup and bottle cap may be rotatably displaced as a unit to remove said bottle cap from the bottle and whereby said cup can be separated from said bottle cap by pulling said cup away from said bottle without rotating said bottle cap.

4,150,762

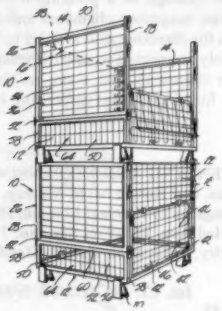
MERCHANDISING BIN

Frederick F. Brunette, Farmington, Mich., assignor to Brilliant Products, Inc., Plymouth, Mich.

Continuation-in-part of Ser. No. 645,898, Dec. 31, 1975, Pat. No. 4,053,955. This application Apr. 18, 1977, Ser. No. 788,320

Int. Cl.[2] **B65D** *7/20, 7/24, 21/02*

U.S. Cl. 220—19 **6 Claims**



1. A collapsible bin comprising:

a base;

first and second sidewalls pivotally mounted to opposed sides of said base and movable between a first and second position, each of and only said sidewalls having tubular framing members about its periphery and criss-crossing wire members secured to and between said framing members, wherein in said first position said sidewalls are generally perpendicular to the plane of said base and generally in a spaced apart and parallel relationship relative to each other and wherein in said second position said sidewalls are generally parallel to the plane of said base;

a back wall constructed of criss-crossing wire members and pivotally secured to the back side of said base, said back wall being movable between a first position generally perpendicular to said base and a second position generally parallel to said base;

a front wall constructed of criss-crossing wire members and pivotally secured to the front side of said base, said front wall being pivotally mounted to said base between a first position generally perpendicular to the plane of said base and a second position generally parallel to the plane of said base;

wherein with said walls in a first position at least one wire member on said front and back walls is adjacent to a framing member on each of said sidewalls;

means for locking the adjacent wire members on said front wall and said back wall to the corresponding framing member on said sidewalls when said front wall, back wall, and sidewalls are in said first position; and

at least one foot secured to the underside of said base along the two opposing sidewalls thereof, wherein said feet are adapted to engage the upper edge of the upper sidewall framing member of a second and lower bin so that said former bin may be stacked upon the similarly formed lower bin whereby substantially the entire weight of said former bin is supported by the tubular sidewall framing members of said lower bin.

4,150,763

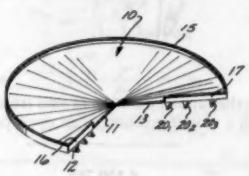
PAINT BRUSH SCRAPER

Catherine L. Simpson, R.R.#2, Etters, Pa. 17319

Filed Apr. 3, 1978, Ser. No. 892,666

Int. Cl.[2] **B65D** *25/00*

U.S. Cl. 220—90 **4 Claims**



1. A paint brush scraper adapted to be installed into the openings of conventional paint cans by securing in the lid grooves thereabout, comprising:

a thin walled conical surface having an exterior peripheral edge extending along a major part of a circle greater in circumference than said openings in said paint cans and having an apex aligned along a central axis common to the center of said peripheral edge, said peripheral edge and said apex defining said surface as a closed conical surface of revolution, said surface being bounded by a pie-shaped cut-out extending between first and second radial edges, each edge aligned from said apex to a corresponding end of said peripheral edge;

a peripheral strip forming a part of a tubular surface attached to said peripheral edge and extending therefrom in a direction substantially opposite to said apex;

a first and second radial segment, each segment joined at one end to the common ends of said peripheral strip and edge, each segment extending along an exterior portion of a corresponding one of said first and second radial edges, the segments, the strip, and the side of said surface adjacent thereto defining an interior side; and

a plurality of partly circular ribs formed on the opposing or exterior side of said conical surface between said radial edges, said ribs being in concentric relationship relative to said apex, each said rib being conformed for receipt in said lid grooves surrounding said openings in said paint cans.

4,150,764

FOOT OPERATED CONTAINER AND CLOSURE DEVICE

Howard A. Anderson, Pittsburgh, Pa., assignor to Cities Service Company, Tulsa, Okla.

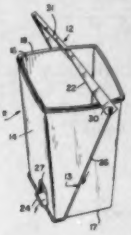
Filed Aug. 14, 1978, Ser. No. 933,397

Int. Cl.[2] **B65D** *43/26*

U.S. Cl. 220—263 **7 Claims**

1. A three element receptacle for receiving material comprising a container, a closure and an operating member, said elements being manually separable, said container having an opening formed with a continuous peripheral beaded rim, the continuity of said rim being interrupted by a pair of opposed depressions defining bearings, said closure carrying arcuate tabs mating with and rotatable within said bearings, said closure being further formed with a channel operable to mate with said beaded rim to keep said closure in register when said closure is in the closed position, said closure being still further formed with slots operable to mate with said beaded rim to keep said closure in register when said closure is in the open position, said operating member being formed with a treadle

and removable and rotatably mounted to said closure at a location spaced from said arcuate tabs effective to develop a



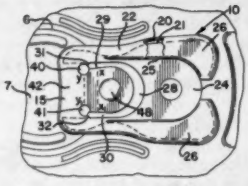
lever arm so that upon operation of said treadle, said closure is pivoted from a closed position to an open position.

4,150,765

TAB CONSTRUCTION FOR EASY OPENING CONTAINER

Stanley L. Mazurek, Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,338
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **11 Claims**



1. A tab for easy opening containers comprising a tab body having means at one end particularly adapted for applying an inwardly directed rupturing pressure on the container panel when the opposite end is moved outwardly, said tab having a bendable mounting ear positioned intermediate its ends for connection to the end panel, and means providing a plurality of hinge axes on said ear for accommodating shifting the bend of the ear from one axis to another attendant to back and forth ear bending movements of said tab and thus impeding fracture of the ear and thereby removal of the tab from the container.

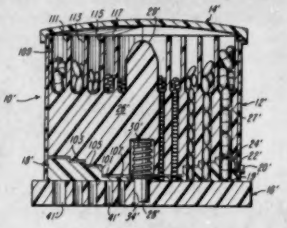
4,150,766

DISPENSING APPARATUS

Thomas H. Westendorf, 1524 Lindenhurst Dr., Dayton, Ohio 45459, and Robert H. Knorr, 21 Medway Dr., Medway, Ohio 45341

Filed Mar. 18, 1977, Ser. No. 778,959
Int. Cl.[2] B65G *59/00*
U.S. Cl. 221—112 **9 Claims**

1. A dispenser for articles in pill, pellet, tablet or capsule form comprising a housing, means defining at least one chamber area in said housing arranged to receive and store said articles in bulk quantities, a magazine having a fixed relation to said housing and having a plurality of passages forming chambers, said magazine chambers being differentially sized to receive different sized articles from said means defining said chamber area, a dispensing device connected for a step by step rotation thereof with respect to said housing, said dispensing device having a plurality of different sized passages corresponding in size to said different sized articles and adapted to communicate with corresponding sized chambers in said magazine in its dispensing operation, and means for directing said articles from said chamber area to load said magazine chambers, said dispensing device having at least one passage to direct articles from said magazine chambers and from a different one or more of said magazine chambers with each step of its rotational movement, said dispensing device being constructed and arranged to normally prevent the exit of articles from said magazine chambers and in the operation thereof to



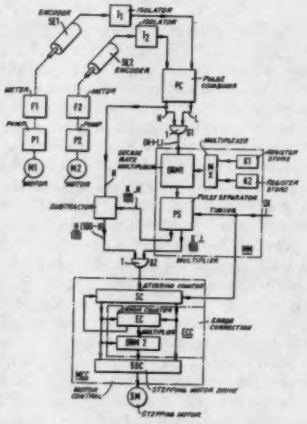
provide for the passage of a predetermined quantity of said articles from said magazine chambers and from said housing, and said means for directing said articles to load said magazine being operatively connected to said dispensing device to move in conjunction therewith and serve its function in a timed relation to the function of said dispensing device.

4,150,767

LIQUID BLENDING AND DISPENSING APPARATUS

Brian E. Pitches, and Robert M. S. Murray, both of Edinburgh, Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Aug. 27, 1976, Ser. No. 718,336
Claims priority, application United Kingdom, Aug. 30, 1975, 35857/75
Int. Cl.[2] B67D *5/08, 5/56*
U.S. Cl. 222—23 **11 Claims**



1. Liquid dispensing apparatus for dispensing a blend of first and second liquids which includes first and second flowmeters each operable to measure the delivered quantities of the first and second liquids respectively and to deliver an output pulse in response to the delivery of a predetermined volume of the liquid, multiplying means for multiplying the number of pulses delivered by each flowmeter by a factor equal to the proportion of one of said liquids in the required blend, subtractor means operable to subtract from the pulse output of the flowmeter measuring flow of said one liquid the output of the multiplying means relating to that flowmeter, a stepping motor rotation of which in one direction decreases the proportion of said one liquid in the blend whilst rotation in the opposite

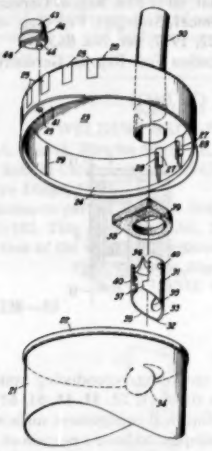
direction increases the said proportion, a motor control circuit responsive to the pulse output from the subtractor to cause the stepping motor to rotate in one direction and responsive to the other output of the multiplying means to cause the stepping motor to rotate in the opposite direction, and error correction means responsive to the accumulated difference between the number of pulses applied to the stepping motor drive circuit from the subtractor means and from the said other output of the multiplying means to inhibit the response of the stepping motor to a number of input pulses determined by the said accumulated difference.

4,150,768

CONTAINER OPENING AND POURING ATTACHMENT

Walter P. Maynard, Jr., 3070 Presidential Dr., Suite 234, Atlanta, Ga. 30340

Filed Mar. 27, 1978, Ser. No. 890,060
Int. Cl.[2] B67B *7/26*
U.S. Cl. 222—89 **11 Claims**



1. An opening and contents pouring device for a cylindrical side wall container having a top container bead comprising: a body portion adapted to be engaged telescopically over one end portion of a container and having a cover top wall, an annular skirt integrally formed with and depending from said cover top wall, a yielding internal rib element on said skirt and spaced below said cover top wall and adapted to engage said cylindrical side wall and to releasably lock said container bead between the top of said rib element and said cover top wall, a yielding indentation formed on the exterior circumference of said skirt and said internal rib element being formed on the interior of said indentation, a pouring spout rising from said cover top wall, and a container piercing blade anchored within said spout and having a piercing portion projecting below said cover top wall and within said skirt.

4,150,769

APPARATUS FOR METERING, MIXING AND DISPENSING FLUIDS

James R. James, Livonia, Mich., assignor to Accuratio Systems, Inc., Novi, Mich.

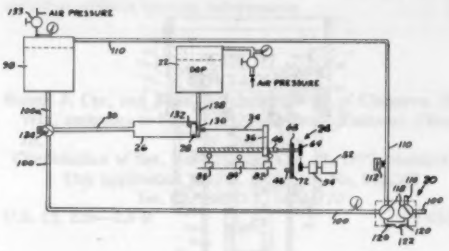
Continuation of Ser. No. 656,634, Feb. 9, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,159
Int. Cl.[2] G01F *11/02*
U.S. Cl. 222—137 **17 Claims**

1. Apparatus fo dispensing a plurality of fluids in a predetermined volumetric ratio which comprises,

a fluid pressure cylinder and piston for each of the fluids to be dispensed,

means including valving by which each said cylinder is adapted to receive a said fluid and to dispense the same responsive respectively to relative movement of said cylinder and piston in one direction and another direction,

means operable to cause said relative movement of said cylinders and pistons for said fluids respectively at rates which are in a ratio coordinated with said volumetric ratio so that fluids are dispensed from said cylinder in said volumetric ratio,



in addition to said operable means a source of another fluid under pressure, said other fluid being inert with respect to the first mentioned fluids,

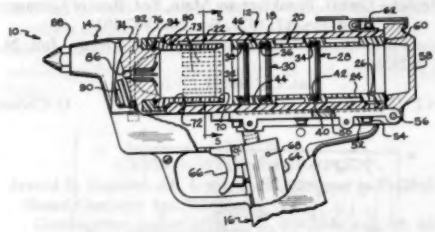
and means operable to introduce said other fluid into each said cylinder on the side of said piston to promote said relative movement in said other direction.

4,150,770

ADHESIVE-APPLYING TOOL

Howard N. Wieland, Jr., Hanover, Mass., and David H. Hammer, Elyria, Ohio, assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 648,494, Jan. 12, 1976, Pat. No. 4,060,180. This application Nov. 24, 1976, Ser. No. 744,710
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—146 HE **9 Claims**

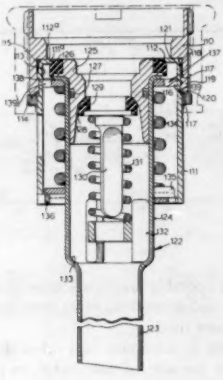


8. An adhesive-applying tool comprising a tool body, wall means within said body forming a cartridge chamber with at least a substantial forward portion of said wall means being spaced inwardly from said tool body, said tool body having a plurality of openings around at least part of said forward portion, with the forward portion of said chamber communicating with said openings in said tool body, fluid pressure means for applying pressure to the rear end of said chamber for urging a cartridge toward a forward end of the chamber, a rear portion of said wall means having a resilient seal for engaging a cartridge within said chamber with said resilient seal being between said fluid pressure means and said forward portion, a heat block at the forward end of said chamber, and means for heating said heat block.

4,150,771
BEER KEG TAPPING CLOSURE UNITS

Cyril G. Golding, Sedgeley, England, assignor to GKN Sankey Limited, Bilston, England

Filed Mar. 24, 1977, Ser. No. 780,798
Claims priority, application United Kingdom, Mar. 27, 1976, 12425/76; Aug. 20, 1976, 34778/76; Dec. 4, 1976, 50660/76
Int. Cl.[2] B65D *83/00*
U.S. Cl. 222—400.7 12 Claims

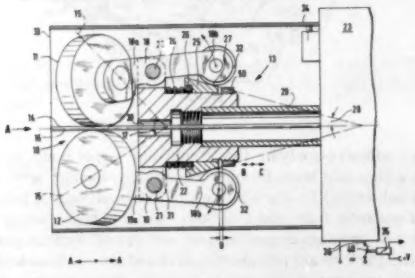


1. A two-part bush for a closure unit, the bush comprising:
a first annular metal part having a counterbore in one end;
a second part in the form of a stainless steel tubular member having a first end portion fixedly held in the counterbore, the tubular member extending outwardly from the counterbore and having support means enabling a spring abutment to be engaged therewith and supported thereon; and
the first end portion of the tubular member second part having a flange on the end projecting inwardly and the flange having a valve seat for a valve means.

4,150,772
PLANETARY WHEEL ADVANCE FOR A MELTABLE WELDING CABLE

Rupert Auer, Eching, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,401
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628386
Int. Cl.[2] B65H *17/20*
U.S. Cl. 226—90 11 Claims

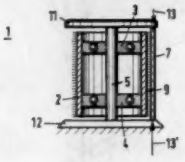


1. A planetary wheel feed mechanism for advancing a meltable welding wire including a hollow motor shaft through which the wire is advanced, a pressure arrangement mounted on said shaft for rotation therewith, said pressure arrangement including a bearing support mounted on said shaft, a plurality of levers mounted to said bearing support parallel to the wire axis, each of said levers having a mounting arm at one end thereof and a bearing arm on the opposite end thereof, a feed wheel secured to each mounting arm of said levers against the wire with said wheels helically disposed with respect to the wire axis whereby rotation of said levers cause said wheels to advance the wire, a conical tensioning ring mounted on said bearing support, each of said levers having its said bearing arm disposed against said tensioning ring for moving said wheels against the wire in such a manner that the wire is advanced independently of the centrifugal force of said rotating levers, and said tensioning ring being longitudinally movable to cause said levers to pivot.

4,150,773
GUIDE ROLLER CONSTRUCTION FOR MAGNETIC TAPE RECORDING/REPRODUCING SYSTEMS, AND ESPECIALLY FOR VIDEO TAPE SYSTEMS

Wolfgang Fell, Seeheim; Heinrich Zahn, Rossdorf, and Peter Gunschmann, Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 22, 1977, Ser. No. 863,179
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659558
Int. Cl.[2] B65H *23/04*
U.S. Cl. 226—196 21 Claims



1. In a magnetic tape recording/reproducing system,
a guide and deflection roller (**1**, **21**, **31**, **41**, **51**, **61**) having a central axis (**5**), a cylindrical engagement surface rotatable about said axis and adapted to have a portion of its surface contacted by the tape (**7**), and at least one end flange (**11**, **12**) projecting radially from the engagement surface to provide for axial guidance of the tape upon engagement of the edges of the tape with a respective flange,
wherein, in accordance with the invention,
the guide surface is resiliently slightly axially movable to provide for slight axial deflection thereof by axial forces acting thereon by the portion of the tape looped over the guide surface, the force opposing radial compression of the surface by the tape being at least ten times the force opposing axial movement exerted by the portion of the tape looped about the circumference of the guide surface of the roller, the guide surface having the characteristic of inherent radial alignment, and providing a restoring force which tends to restore that portion of the guide surface not contacted by the tape to undeflected position.

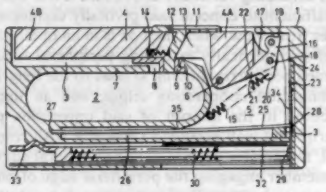
4,150,774
LOW LINE TACKER

Owen M. Wright, Swansea, Wales, assignor to Ofrex Group Limited, London, England

Filed Sep. 9, 1977, Ser. No. 832,105
Claims priority, application United Kingdom, Sep. 13, 1976, 37921/76
Int. Cl.[2] B25C *5/10*
U.S. Cl. 227—132 5 Claims

1. A trigger-operated staple tacking device comprising a body, an operating handle pivotally connected at one end to said body, a trigger-actuated staple driving mechanism, a return spring operatively connecting said body and said handle, operation of the trigger to actuate the staple driving mecha-

nism of the device being effected by squeezing the end of said handle opposite the pivoted end and said body together against the action of the return spring, said return spring being operative to return said handle to a position projecting from said body on release of said handle, said body having a channel-



shaped recess to receive the whole of said operating handle in a storage position when the device is not in use, cooperating retaining means operatively connecting said handle and said body in said body recess to hold said operating handle in its storage position in said body recess against the action of said return spring.

4,150,775

WELDING BACK-UP TAPE

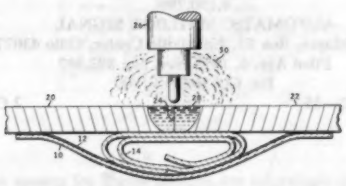
William A. Roden, Rancho Santa Fe, and Glenn L. Criger, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 689,416, May 24, 1976, Pat. No. 4,049,183. This application Jul. 21, 1977, Ser. No. 817,635

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] B23K *9/02*

U.S. Cl. 228—50 **9 Claims**



1. A welding back-up tape comprising:

an elongated narrow thin strip of flexible flat material;

an adhesive coating on one surface of said strip;

an elongated refractory fiber fabric sheet rolled about an axis parallel to the longer sides of said sheet;

said roll having at least two fabric layers around the circumference of said roll and a hollow core;

said roll being in bonding contact with said strip substantially along the centerline of said strip;

whereby said roll and said strip may be pressed against a structure and held in place by said adhesive coating along the edges of said strip adjacent to said roll.

4,150,776

METHOD OF JOINING METAL PARTS

Jacques Lesgourgues, Corbeil, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 22, 1978, Ser. No. 880,086

Claims priority, application France, Feb. 24, 1977, 77 06149

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—194 **10 Claims**

1. The method of solidly joining parts made of stainless steel or of superalloy, comprising the steps of: interposing a layer of an interface material of at least one selected from a group containing tin, indium, antimony, gallium and germanium between contacting surfaces of the parts, subjecting the assembly to a heat treatment under a controlled atmosphere, at a temperature higher than 900° C. but lower than the solidus point of the parts to be joined, for an interval of time sufficient to permit the migration of the interface material and the formation of compounds or solutions which ensure the diffusion brazing of the parts to be joined, and during at least a portion of the treatment, subjecting the parts to a moderate holding pressure to maintain their relative position and to promote the diffusion without causing deformation.

4,150,777

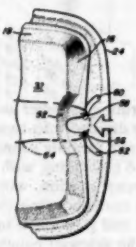
CONTAINER

Steven J. Cyr, and John C. Schubert, both of Chippewa Falls, Wis., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 826,719, Aug. 22, 1977, abandoned. This application May 3, 1978, Ser. No. 902,340

Int. Cl.[2] B65D *1/24, 43/10*

U.S. Cl. 229—2.5 R **5 Claims**



1. In a deformable container comprising top and base members, said base member having outwardly and upwardly sloping front side and rear walls and said top member having outwardly and downwardly sloping front side and rear walls, latch means adapted to form a secure closure between said top and base members, each said latch means comprising a lip on the outer end of a wall on one of said members, a shoulder having a downwardly extending sidewall projecting inwardly from said lip on said wall, two slots extending through the sidewall of said shoulder, and two tabs on the other of said members adapted to interlock with said slots and projection on said base adapted to support an article in said container so as to permit gas flow between an article in said container and said base.

4,150,778

CARTON WITH POUR SPOUT

Arnold B. Engdahl, Jr., Irwin, Calif., assignor to Federal Paper Board Company Inc., Montvale, N.J.

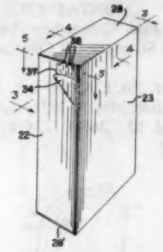
Continuation-in-part of Ser. No. 824,351, Aug. 15, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,105

Int. Cl.[2] B65D *5/74*

U.S. Cl. 229—17 R **8 Claims**

1. An elongate blank of paperboard, or similar foldable sheet material, which is cut and scored to form a tubular carton, said blank being divided into a series of sidewall forming panels by longitudinally spaced, parallel, transverse hinge forming score lines, with a panel at one end of the blank being adapted to be folded into underlying relation with the sidewall forming panel at the opposite end of the blank and to be secured thereto so as to form a sidewall connecting panel, said sidewall forming panel at said opposite end of the blank having a generally triangular shaped pull tab formation defined by a hinge forming score line of predetermined length extending diagonally of said panel from a point on a transverse score line which defines one end of a tear line portion of the hinge forming score line

between said sidewall panel and the adjoining sidewall panel and a cutting line which extends from the outboard end of said hinge forming score line across said panel to a point on said transverse score line which is spaced a predetermined distance from said first mentioned point on said transverse score line, the portion between said spaced points constituting said tear line and said cutting line defining the outboard edge of said pull tab, said sidewall connecting panel having a panel portion extending in the direction longitudinally of the blank with a transverse score line which is spaced from the hinge score line a distance corresponding to the dimension of the sidewall panel in the longitudinal direction at the opposite end of the blank



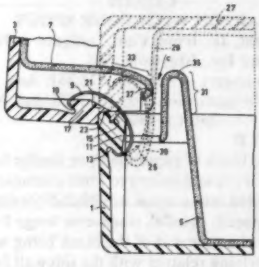
and an inner spout forming member cut in said connecting panel portion which is divided into two generally triangular shaped sections by a hinge forming score line extending transversely of the blank and coinciding with said transverse score line in said extension panel portion, with one of said sections having a configuration corresponding to the configuration of said pull tab formation and positioned in said extension panel portion so that when the sidewall panels are folded and connected, in forming the carton, said one section of said inner spout member will be disposed substantially in registry with and lie against the inside face of said pull tab formation while said associated triangular section will lie against the inside face of the adjoining sidewall panel.

4,150,779

BOX CONSTRUCTION

Hans A. Hilbrands, Westervelde, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 687,665, May 19, 1976, abandoned.
This application Oct. 12, 1977, Ser. No. 841,591
Claims priority, application Netherlands, Jun. 2, 1975, 7506496
Int. Cl.[2] B65D *5/66, 25/14*
U.S. Cl. 229—44 R **1 Claim**



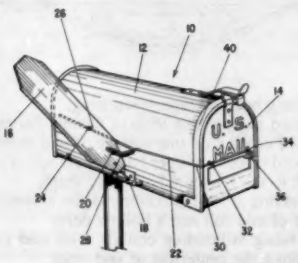
1. A box comprising an upper box part and a lower box part pivotally connected to each other along respectively cooperating edges and movable relative to each other at such cooperating edges over a pivot angle smaller than 120°; a lower dish member secured to the interior of said lower box part and having a peripheral wall arranged vertically with respect to a bottom wall, the greater portion of the peripheral edge of said lower dish member engaging the peripheral edge of said lower box part, the peripheral wall of said lower dish member over the remainder of the periphery of said lower dish member being spaced from the opposing peripheral wall of said lower box part and extending vertically above said lower box part for a distance sufficient to conceal said pivotally connected cooperating edges from view when the box is in an open condition, the width of said vertically extending peripheral wall of said lower dish member corresponding at least to the length of said pivotally connected cooperating edges; and an upper dish member secured to the interior of said upper box part and having a peripheral wall arranged vertically with respect to a bottom wall, the greater portion of the peripheral edge of said upper dish member engaging the peripheral edge of said upper box part, the peripheral wall of said upper dish member over the remainder of the periphery of said upper dish member being spaced from the opposing peripheral wall of said upper box part and extending outwardly beyond said upper box part for a distance equivalent to that of the vertically extending wall of said lower dish member, the width of said outwardly extending peripheral wall of said upper dish member corresponding at least to the length of said pivotally connected cooperating edges, said upper dish member-upper box part spacing being less than the corresponding lower dish member-lower box part spacing, said outwardly extending peripheral wall of said upper dish member being situated a short distance from the vertically extending of the lower dish member when the box is in an open condition, and said outwardly extending peripheral wall of said upper dish member, when the box is in a closed condition, projecting into the slot-like spacing between the peripheral wall of the lower box part adjacent said pivotally connected cooperating edges and the opposing peripheral wall of the lower dish member.

4,150,780

AUTOMATIC MAILBOX SIGNAL

Leland O. Mapes, Box 63, Unionville Center, Ohio 43077

Filed Apr. 6, 1978, Ser. No. 893,987
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—35 **2 Claims**



1. An automatic signalling device for a mailbox of the type having an enclosed receptacle with a hinged door for access to its interior, the signalling device comprising:

(a) a signal flag pivotally mounted to the exterior and side of said mailbox and having a first catch means comprising a hole through said signal flag, said signal flag having a raised, latched position and a lower activated position to which it will fall by gravity, said flag being aligned and pivotally mounted for pivotal movement in a plane which is laterally transverse to said receptacle and parallel to said door when in the closed position;

(b) an elongated activating member slideably mounted to the exterior of said receptacle and pivotally attached to said door, said activating member having a second catch means mating with said first catch means of said flag for retaining said signal flag in said raised position when said

door is closed and for being slid toward said door and releasing said latching means upon opening of said door, said second catch means comprising a bayonet extending rearwardly through said hole when said door is closed and withdrawable from said hole upon opening of said door, said activating member more particularly comprising a rod member slideably mounted to said receptacle rearwardly of said signal flag, said rod extending forwardly and having an L-shaped bend laterally of the door for extending across the front, exterior face of said door, said rod being pivotally connected to front fastener means mounted to the face of said door and bent to prevent lateral withdrawal from said front fastener means, said rod member having said bayonet formed thereon.

4,150,781

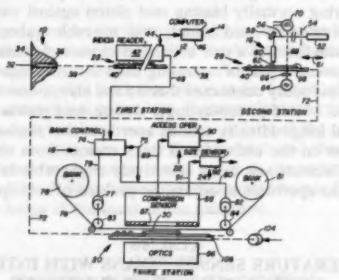
ACCESS AUTHENTICATION SYSTEM

Daniel Silverman, 5969 S. Birmingham Ave., Tulsa, Okla. 74105, and Everett A. Johnson, 15 S. Prospect Ave., Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 495,632, Aug. 8, 1974, Pat. No. 3,999,042, which is a division of Ser. No. 272,739, Jul. 18, 1972, Pat. No. 3,829,661, which is a continuation-in-part of Ser. No. 74,066, Sep. 21, 1970, Pat. No. 3,677,465. This application Dec. 21, 1976, Ser. No. 752,912

Int. Cl.[2] **G06K** *5/00, 7/10, 19/06, 21/00*

U.S. Cl. 235—382 **11 Claims**



1. A system for access control, for selectively granting access on presentation and authentication of a control token, said system comprising:

A. a bank comprising

(1) magnetic storage means for storing a plurality of unique authenticating master coded magnetic bit patterns, each in different address locations;

(2) a plurality of address locations in said magnetic storage means, each address being an index of the magnetic bit pattern stored therein;

B. a plurality of control tokens, each control token comprising

(1) an unique object;

(2) means on said object for storing in machine readable form an unique index;

(3) means on said object for storing in machine readable and machine writeable form an unique coded bit pattern of magnetically altered areas;

(4) each of said control tokens having one of said unique indicia and the corresponding unique authenticating coded magnetic bit patterns stored in said bank;

C. reading means to which a control token can be presented, said reading means including first means to read said indicium, and second means to read said magnetic bit pattern on said token;

D. means responsive to said first means to select from said bank said magnetic bit pattern corresponding to said indicium;

E. means to compare the magnetic bit pattern read from said token with the magnetic bit pattern in said bank corresponding to the read indicium;

F. means to produce a plurality of unique magnetic bit patterns; and

G. means responsive to said comparison means to select a different unique magnetic bit pattern from said means to produce, and to write a new unique bit pattern on said token and in said bank in an address corresponding to said indicium on said token.

4,150,782

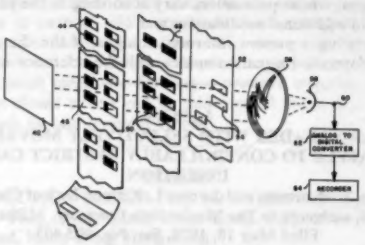
DATA PROCESSING SYSTEM

Harry B. Ditmore, Jr., 4321 SW. Washouga, Portland, Oreg. 97201

Continuation of Ser. No. 532,439, Dec. 13, 1974, which is a continuation of Ser. No. 385,153, Aug. 2, 1973. This application Mar. 10, 1977, Ser. No. 776,560

Int. Cl.[2] **G06K** *7/10;* **G06F** *5/00;* **G09B** *23/28*

U.S. Cl. 235—455 **26 Claims**



1. A data processing system comprising:

storage means storing retrievable information in the form of data representing a quantity for each of a plurality of items, said quantities being linearly related and each of which is a measure of the probability of the presence of a respective item within a category and of the probability of the non-presence of said item in said category, the sum of the quantities for each item representing substantially one,

means for reading out said quantities from said storage means,

means for converting each of the quantities being read out from the storage means to a logarithmic output,

means for receiving and adding the converted quantities to provide an output of a value indicative of the logarithm of the product of said quantities, and

sample means for transmitting to the means for receiving and adding only selected ones of the logrithmic output which correspond respectively to those items probably present in said category and to other items probably not present in said category.

4,150,783

METHOD FOR READING INFORMATION FROM PUNCHED CARRIER AND DEVICE FOR EFFECTING SAME

Sergei S. Litovchenko, ulitsa Oktyabrskaya, 4, kv. 39, Kaluga, and Vladimir D. Alyapkin, ulitsa 50 let Oktyabrya, 5, korpus 3, kv. 29, Solntsevo Moskovskoi oblasti, both of U.S.S.R.

Filed Sep. 26, 1977, Ser. No. 836,561

Int. Cl.[2] **G06K** *7/14;* **G08C** *9/06*

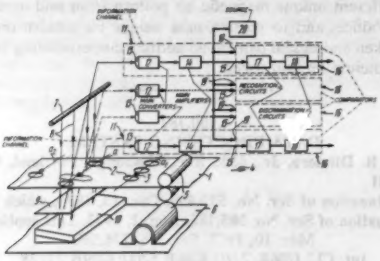
U.S. Cl. 235—458 **56 Claims**

1. A method for reading information from a punched carrier, comprising the following successively performed operations:

modulating a radiation flux, emitted by a radiation source, by information holes of an information combination of holes being interrogated of the punched carrier;

additionally modulating the radiation flux, modulated by the

information holes of the punched carrier, by an additional modulation means;
reflecting the radiation flux by a reflector;
converting the radiation flux, reflected by the reflector, into primary information signals;



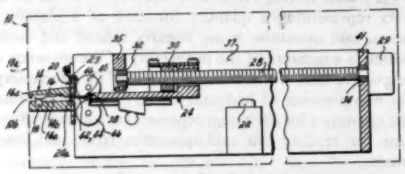
comparing said primary information signals with a reference signal whose parameters vary according to the pattern of said additional modulation; and
generating a present information signal if the the primary information signal coincides with the reference signal.

4,150,784

CARD READER WITH SELECTIVELY MOVABLE BAFFLE TO CONTROLLABLY RESTRICT CARD INSERTION

Charles J. Moorman, and Jerome L. Kistner, both of Cincinnati, Ohio, assignors to The Mosler Safe Company, Milford, Ohio

Filed May 15, 1978, Ser. No. 905,403
Int. Cl.[2] G06K *13/08*
U.S. Cl. 235—479 **3 Claims**



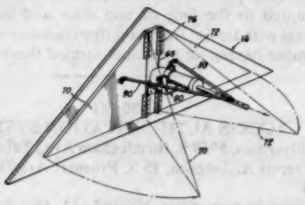
1. A reader for a card having information recorded thereon, comprising:
a protective housing having a card insertion slot in a wall thereof,
a relatively stationary information transducer located within said housing,
a card carriage for supporting said card for movement in a path past said transducer to read information therefrom,
a carriage guide mounting said card carriage for movement between first and second points between which said path is located, said first and second travel points being proximate said baffle and transducer, respectively,
a baffle mounted for movement between a blocking position and unblocking position, said baffle configured to prevent insertion of said card beyond said baffle when in said blocking position and to permit insertion of said card beyond said baffle when in said unblocking position, said baffle normally being positioned in said blocking position,
an actuating element mounted on said carriage for movement therewith, and
means mounted to said baffle, which is physically engageable with said actuating element when said carriage is proximate said baffle, for directly imparting movement to said baffle to move it from its blocking position to its unblocking position when said carriage is proximate said baffle and moving toward its first limit of travel, said actuating element facilitating movement of said baffle from its unblocking position to its blocking position when said carriage moves away from its first limit of travel.

4,150,785

TEMPERATURE CONTROLLED GABLE VENT

Harry H. Briscoe, Rte. 10 Burnett Ferry Rd., Rome, Ga. 30161

Division of Ser. No. 752,565, Dec. 20, 1976, Pat. No. 4,125,222.
This application Nov. 7, 1977, Ser. No. 849,238
Int. Cl.[2] F24F *7/02*
U.S. Cl. 236—49 **2 Claims**



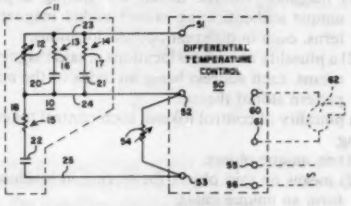
1. An automatically operating vent structure for venting an attic space, comprising a movable valve member and an actuator connected to said valve member to move the same back and forth between open and closed positions, said actuator being in the form of a piston-cylinder device defining a closed expansible chamber, a charge of low boiling point liquid in said chamber, a spring normally biasing said piston against vapor pressure generated by said liquid, said movable valve member being in the form of a pair of hinged closure elements for the vent structure, a pair of operating links for the hinged closure elements pivotally connected thereto and also connected to the piston rod of said piston-cylinder device, said piston rod having plural longitudinally spaced apertures therein, and lateral extensions on the ends of said links remote from the hinged closure elements and being selectively engageable in different ones of the apertures to adjust the preload of said spring.

4,150,786

TEMPERATURE SENSOR MEANS WITH INTEGRAL TEMPERATURE LIMIT FUNCTIONS

Donald E. Sable, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 15, 1977, Ser. No. 815,895
Int. Cl.[2] F24D *11/00*
U.S. Cl. 236—91 A **9 Claims**



1. Temperature sensor means having integral temperature limit functions adapted to be connected to a temperature control system, including: temperature responsive resistance means including connection means adapted to be connected to said temperature control system; temperature responsive switch means connected to said connection means with said temperature responsive switch means responsive to a limit temperature to override the control of said temperature responsive resistance means in the event said limit temperature is reached; said temperature responsive switch means including at least a temperature responsive switch in series with a resistor with said resistor having an ohmic value selected to be parallel connected with said temperature responsive resistance means

to cause said sensor means to safely limit the operation of said temperature control system at said limit temperature; and enclosure means enclosing said temperature responsive resistance means and said temperature responsive switch means in a common temperature environment.

4,150,787

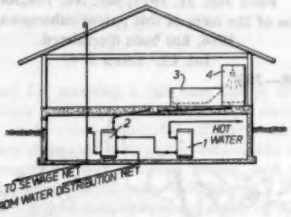
METHOD AND ARRANGEMENT FOR SAVING ENERGY IN PREPARING HOT WATER FOR HOUSEHOLD

Chris R. Braathen, 4645 Belvedere Dr., P.O. Box 686, Julian, Calif. 92036

Division of Ser. No. 764,578, Feb. 1, 1977, abandoned. This application Apr. 4, 1978, Ser. No. 893,417

Int. Cl.[2] F24H *1/00*

U.S. Cl. 237—1 A **3 Claims**



1. An arrangement for saving energy in preparing hot water for households, comprising a heat insulated container with a thermostatically controlled electric heating element, which container is supplied with the water to be heated, characterized in that the lower part of the container is surrounded by an exteriorly heat insulated mantle with an inlet at the top of the mantle, for warm waste water from bathtub and shower, etc. and an outlet for the warm waste water at the bottom of the mantle, which outlet is connected to a water trap at the outlet of which being at the level of the said inlet.

4,150,788

REMOTE-CONTROLLED CENTRAL AIR-CONDITIONING SYSTEM

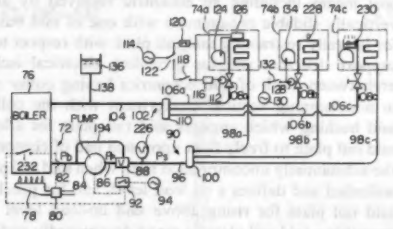
Yoshihisa Matsumoto; Hiroaki Yonekubo, and Shoji Hatsutori, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 8, 1977, Ser. No. 814,027

Claims priority, application Japan, Jul. 8, 1976, 51-81655; Jan. 13, 1977, 52-3377; Jan. 19, 1977, 52-5320; Jan. 28, 1977, 52-8977; Feb. 15, 1977, 52-15665

Int. Cl.[2] F24D *3/00*

U.S. Cl. 237—8 R **23 Claims**



1. A central air-conditioning system comprising a central heat-exchanger unit operative to produce liquid heat-exchange medium therein; a plurality of terminal air-conditioning units each adapted to pass the liquid heat-exchange medium therethrough; forced-flow inducing means having a liquid inlet end in communication with said central heat-exchanger unit and operative to deliver from the liquid outlet end the liquid heat-exchange medium under pressure; circuit means including a liquid supply circuit comprising a main supply passageway communicable with the liquid outlet end of said forced-flow inducing means and branch supply passageways leading from the main passageway and respectively terminating in said terminal air-conditioning units and a return circuit communicable with said terminal air-conditioning units and terminating in said central heat-exchanger unit; terminal valves provided between said central heat-exchanger unit and said terminal air-conditioning units, respectively, and each having open and closed conditions; and control means provided between the liquid outlet end of said forced-flow inducing means and said main supply passageway and responsive to operational conditions of said circuit means having a first condition in which at least one of said terminal valves is open, a second condition in which one of the terminal valves is being closed with the remaining terminal valves fully closed, and a third condition in which all of the terminal valves are fully closed, said control means being operative to render said central-heat exchanger unit and said forced-flow inducing means operative in response to said first condition of the circuit means and inoperative in response to each of said second and third conditions of the circuit means and to disconnect said circuit means from said forced-flow inducing means in response to said third condition of the circuit means for forming a pressure trapping circuit which is closed at one end by said control means and at the other ends by said terminal valves.

4,150,789

CONNECTION DEVICE FOR TOY VEHICLE TRACKS

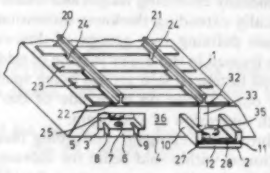
Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 807,102, Jul. 16, 1977, abandoned. This application Nov. 18, 1977, Ser. No. 852,634

Claims priority, application United Kingdom, Jul. 22, 1976, 30661/76

Int. Cl.[2] A63H *19/30*

U.S. Cl. 238—10 E **6 Claims**



1. A toy railroad track section comprising:

(a) an elongate base formed of molded plastic material,

(b) a pair of spaced electrically conductive rails along which the toy is to run, the rails being attached to and supported by the base, and extending along the base from one end to the other end thereof,

(c) a protruding plug and a socket integrally formed with the base at each end of the base, the plug and the socket being so shaped, dimensioned and positioned that when two track sections are joined together, the plug of one section fits in the socket of the adjacent section,

(d) each plug having a channel-shaped cross-section defined by two upright side portions having lower ends and a horizontal portion having an underside and an upper side forming the lower ends of the side portions,

(e) a projecting detent integrally formed with the plug and projecting downwardly from the underside of the horizontal portion,

(f) an electrically conductive plate positioned adjacent the upper side of the horizontal portion and fitting within the upright side portions and the length of the plug,

(g) means electrically connecting the conductive plate with one of said rails,

(h) each of the sockets being defined by upper and lower horizontally extending walls and upright side walls of the base and forming a recess for receiving a plug of another track section for joining two such sections to each other,

(i) a pair of spaced slots extending partway along the lower horizontally extending wall of the socket so as to define a resilient portion of the lower wall,

(j) a cut-out in the resilient portion positioned to receive the detent of the plug, the detent being shaped and arranged to resiliently deform the resilient portion as two track sections are being joined until the detent enters the cut-out, to thereby enable a mechanical interlocking of two track sections, and

(k) a resilient electrically conductive strip electrically connected to one of the rails and extending downwardly across each socket, whereby when two track sections are joined together, the strip contacts the plate of the plug fitted into the socket.

4,150,790

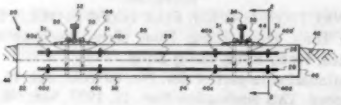
REINFORCED MOLDED LIGNOCELLULOSIC CROSSTIE AND RAILWAY ASSEMBLY

Edward Potter, Beaverton, Oreg., assignor to Edward Potter, Beaverton and Dant & Russell, Inc., Portland, both of, Oreg.

Filed Jun. 20, 1975, Ser. No. 588,786

Int. Cl.[2] E01B 3/10

U.S. Cl. 238—83 **2 Claims**



1. A reinforced railroad crosstie comprising:

(a) an elongate monolithic beam of compressed, bonded comminuted lignocellulosic material, said beam having horizontally extending length and width dimensions and a vertically extending thickness dimension;

(b) means defining two groups of downwardly extending holes formed in the upper surface of said beam for receiving rail fasteners, said groups being spaced longitudinally from one another on each side of the midpoint of said length dimension of said beam;

(c) a plurality of elongate reinforcing means longitudinally positioned within said beam for increasing the resistance thereof to bending, an upper one of said reinforcing means being located above the neutral bending axis of said beam and extending longitudinally through the midpoint of said length dimension of said beam, and a lower one of said reinforcing means being located below said neutral bending axis and extending longitudinally through the locations of said groups of holes to locations on both sides of each of said groups of holes;

(d) a plurality of laterally extending protrusions within said beam fixedly attached to said upper and lower reinforcing means, two of said protrusions being positioned along said upper reinforcing means as a first spaced pair, said first pair of protrusions being spaced longitudinally from one another and located on either side of the midpoint of said length dimension of said beam at positions adjacent a respective one of said groups of holes, said upper reinforcing means being free of any said protrusion between said first pair of protrusions; and

(e) at least two further pairs of said protrusions being positioned along said lower reinforcing means as second and third spaced pairs, the protrusions of each of said second and third pairs respectively being spaced longitudinally with respect to one another and located on either side of a respective one of said groups of holes, said lower reinforcing means being free of any said protrusion between the protrusions of said second pair and between the protrusions of said third pair respectively.

4,150,791

RAIL FASTENER

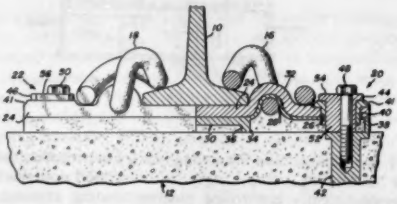
Clarke Reynolds, 535 Hillary Dr., Tiburon, Calif. 94920, and Richard J. Quigley, 25538 Adobe La., Los Altos Hills, Calif. 94022

Filed Jan. 31, 1977, Ser. No. 764,306

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.[2] E01B 9/48

U.S. Cl. 238—282 **4 Claims**



1. A fastener for supporting a rail on a support structure comprising:

a rail plate including, an upper surface for nonresiliently supporting the rail, a pair of spaced apart openings and a well dimensioned to accommodate the rail and secure the rail against lateral movement, the sides of said well being formed by bows of generally U-shaped configuration in said rail plate;

clip means anchored in the channel formed in the underside of said rail plate by said bow and clampingly engaging said rail plate, said clip means being shaped and located to allow said rail to rise above said rail plate under the application of an upwardly directed force applied to said rail;

a pad of elastomer mounted between said rail plate and the support structure;

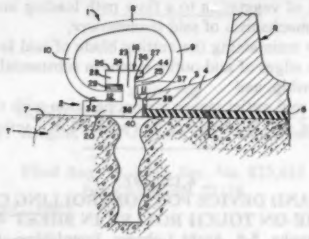
electrical insulator bushing means of a substantially nonresilient material dimensioned to be received by said openings and having collars for engaging the upper surface of said rail plate; and

a pair of post means connected to the support structure, each post means including an eccentric received by and in vertically slidable engagement with one of said bushings for laterally restraining said rail plate with respect to said support structure and for providing electrical isolation therebetween, each of said eccentrics having collar means in nonclamping vertical engagement with the collar of said bushing which engages said rail plate for allowing said rail plate to freely float upon said pad of elastomer in the substantially uncompressed state when said rail plate is unloaded and defines a no-load level, and for precluding said rail plate for rising above said no-load level while permitting said rail plate to move downwardly under the application of a downwardly directed force applied to said rail, each of said post means further including an insert embedded into the support structure and an anchor bolt for clamping said eccentric firmly against said insert thereby releasably restraining vertical and rotational movement of said eccentric.

4,150,792
RAIL FASTENER

Khurshid A. Qureshi, Bolingbrook, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Feb. 25, 1977, Ser. No. 772,095
Int. Cl.[2] E01B 9/30, 9/34
U.S. Cl. 238—349 16 Claims

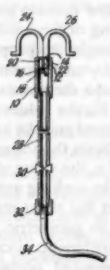


1. A fastener for securing a rail base flange to a crosstie including, anchor means provided with clip retaining means secured atop said crosstie laterally adjacent said rail base flange, a unitary elongated spring clip removeably attached to said anchor means by said retaining means, said spring clip provided with an uppermost main wall having a longitudinal axis parallel to said rail base flange and a pair of substantially symmetrical curved end walls joined to lowermost free arms having substantially opposed distal edges resiliently deflectable vertically and transversely of said longitudinal axis, said pair of arm edges disposed in a substantially parallel spaced-apart relationship, a first one of said arms overlying the top surface of said rail base flange and having its distal edge facing away from said rail base flange and juxtaposed said clip retaining means laterally adjacent said rail base flange, a second one of said arms disposed within and engageable by said clip retaining means, said second arm edge having a vertical thickness of substantially constant extent throughout its length, said retaining means including integral stationary camming means engaging and resiliently deflecting said second clip arm transversely of said longitudinal axis and downwardly below the horizontal plane of said first clip arm, and said camming means includes a tapered groove the entrance of which is of greater height than said second arm edge vertical thickness, whereby, said first clip arm is biased downwardly against said rail base flange top surface to retain said rail base flange upon said crosstie when said second arm edge is longitudinally inserted into said tapered groove.

4,150,793
GUTTER CLEANING APPARATUS

Alberto Russo, 413 Waverly Ave., Mamaroneck, N.Y. 10543

Filed Feb. 3, 1978, Ser. No. 874,805
Int. Cl.[2] B05B 1/14, 12/04
U.S. Cl. 239—532 6 Claims

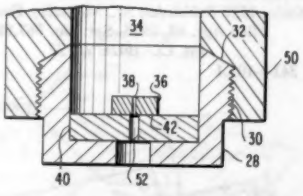


1. Valve apparatus comprising hollow housing means having influent port means and effluent port means, a flow path being defined in said housing means between said influent port means and said effluent port means, said effluent port means having first opening means and second opening means, valve means mounted in said housing means, said valve means extending along a longitudinal axis displaceable to project into said flow path, said valve means arranged to swing in said housing means for alternately closing said first opening means and said second opening means, said valve means terminating in stream deflector means, said stream deflector means operatively connected to said valve means by stream deflector hinge means, said stream deflector means extending along a longitudinal axis, said axis of said stream deflector means being displaceable to project into said flow path at a first angle with respect to the axis of said valve means when said valve means is positioned to close said first opening means or said second opening means, said stream deflector hinge means holding said valve means and said stream deflector means so that the said axis of each is at said first angle when said valve means is displaced into said flow path and said axis of said valve means projects into said flow path, said axis of said stream deflector means being displaceable to project into said flow path at a second angle with respect to the axis of said valve means when said valve means is positioned to close the other of said first opening means or said second opening means, said stream deflector hinge means holding said valve means and said stream deflector means so that the said axes of each is at said second angle when said valve means is redisplaced into said flow path and said axis of said valve means projects into said flow path whereby when fluid under pressure is passed through said flow path, fluid will impinge on said stream deflector means to force said valve means into one of said first openings or second openings and allow fluid to flow through the other of said first openings or second openings said axis of said stream deflector means being displaced at said first angle into said flow path, and when fluid pressure is reduced, the axis of said valve means will be aligned substantially parallel to the direction of fluid flow in said flow path, said stream deflector means will remain at said first angle to said valve means so that by increasing fluid pressure said valve means will be deflected by said stream delector means to close the other of said first openings or said second openings and said first angle between said stream deflector means and said valve means will be changed to said second angle.

4,150,794
LIQUID JET CUTTING NOZZLE AND HOUSING

Bobby L. Higgins, Dallas, Tex., assignor to Camsco, Inc., Richardson, Tex.

Filed Jul. 26, 1977, Ser. No. 819,190
Int. Cl.[2] B05B 1/00
U.S. Cl. 239—596 10 Claims



1. In a high-velocity liquid cutting jet system having a high-velocity nozzle with an orifice emitting a collimated jet of liquid for cutting purposes, a high-pressure conduit to deliver the liquid to the nozzle, a housing for said nozzle, a mounting plate for positioning said nozzle in the housing, the improvement wherein said housing is made from a material that is substantially undeformable at ambient conditions but yields under the working pressure of the liquid and said nozzle being loosely positioned on a portion of said mounting plate, said portion receiving pressure generated by said liquid onto said

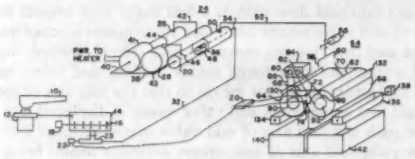
nozzle in the direction of liquid flow to effectuate a sealing arrangement between said nozzle and said mounting plate.

4,150,795

WASTE FOOD PROCESSOR

Donald F. Link, Huntsville, Ala., assignor to Recovery Systems, Inc., Charleston, S.C.

Filed Aug. 3, 1977, Ser. No. 821,353
Int. Cl.[2] B02C *11/08*
U.S. Cl. 241—33 **3 Claims**



1. A waste food processor comprising:

pulverizing means for reducing the particle size of waste food to a particle size of 0.005 to 0.030 inch in thickness;

buffer storage means for receiving the output of said pulverizing means and making it available as an output, on demand;

drying means for receiving the output of said buffer storage means and comprising:

a pair of rotating drums positioned parallel, side by side, with counter-rotating surfaces spaced apart 0.006 to 0.030 inch at a nip line between drums,

a reservoir formed between upper adjacent portions of said drums, and including dams engaging between drums at ends of the drums,

elevation sensing means for sensing the level of material dammed between said drums, and including means responsive to said sensing means for selectively pumping material from said buffer storage means to said reservoir for maintaining the level of material in said reservoir between selected limits, and

means for evenly maintaining heat in said drums at a temperature in the range of 300° F. to 400° F., whereby material passing through said nip line coasts said drums; and

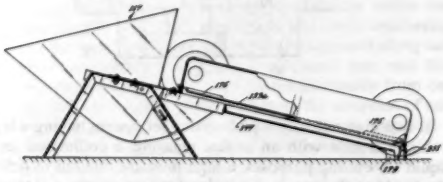
blade means in engagement with each said drum along a line spaced 180° to 230° of angular rotation from said nip line for removing dried material from said drum.

4,150,796

APPARATUS FOR SHREDDING VEGETATION

Ben B. Kudo, 1523 Pebbledon St., Monterey Par, Calif. 91754

Filed Apr. 14, 1975, Ser. No. 567,986
Int. Cl.[2] B02C *18/22*
U.S. Cl. 241—101.1 **12 Claims**



1. Apparatus for shredding vegetation comprising in combination

a lawnmower,

means for supporting said lawnmower and retaining it in a predetermined position including

frame means and

stop means mounted on said frame means for abutment with said lawnmower,

means defining a chute including

inlet means located so as to receive vegetation and other shreadable materials therein,

outlet means located immediately adjacent to the cutting mechanism of said lawnmower, and

means about said outlet means for confining the movement of vegetation to a flow path leading into the cutting mechanism of said lawnmower,

means for maintaining the cutting blade of said lawnmower and the edges of said outlet means in substantially parallel relationship, and

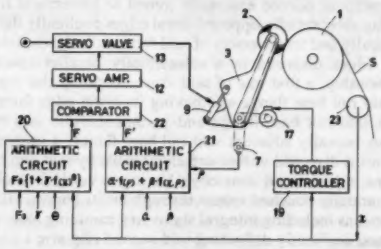
means in said outlet means for cooperation with the cutting blade of said lawnmower in a scissors-like action.

4,150,797

METHOD AND DEVICE FOR CONTROLLING CONTACT PRESSURE ON TOUCH ROLLER IN SHEET WINDER

Hiroshi Kataoka, 5-8, Asahi 1-chome, Iyomishima-shi, Ehime-ken, Japan

Continuation-in-part of Ser. No. 609,907, Sep. 3, 1975, abandoned. This application May 12, 1978, Ser. No. 905,463
Claims priority, application Japan, Aug. 8, 1975, 50/95743
Int. Cl.[2] B65H *17/02, 23/00*
U.S. Cl. 242—67.1 R **2 Claims**



1. In a sheet winder of the type wherein the sheet roll being wound is supported at the free end of a rocking arm and held in contact with a touch roller at a constant pressure determined by the difference between the component of the combined weight of the rocking arm and the sheet roll acting in the direction of the axis of the touch roller and a component of force acting in the opposite direction applied to the rocking arm by a servo mechanism, a method for the control of the contact pressure between the sheet roll and the touch roller, which method comprises:

programming a first arithmetic circuit to perform arithmetic operations in accordance with the formula:

$$F = F_o\{1 + \gamma f(x)^{\theta}\}$$

wherein F is the desired contact pressure, F_o is the contact pressure at the beginning of the winding operation, x is a variable whose value changes in proportion to the increasing weight of the sheet roll γ and θ are numerical values predetermined empirically for the sheet material to be wound,

feeding the value of F_o, the values of γ and θ determined for the sheet to be wound and the value of x to the first arithmetic circuit to obtain the value F,

feeding the value of x, the value of ρ representing the angle of inclination of the rocking arm and values representing the unit weight of the sheet material, the weight of the rocking arm and its geometric relationship to the touch roll to a second arithmetic circuit programmed to calculate the uncompensated contact pressure between the sheet roll and the touch roll and obtaining the uncompensated contact pressure as the value F',

feeding the values of F and F' to a comparator circuit to

obtain a signal corresponding to the difference therebetween, and

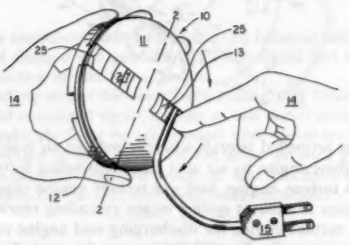
feeding the difference signal to the servo mechanism to control the force it exerts on the rocking arm, whereby the contact pressure between the sheet roll and the touch roll is adjusted to the desired contact pressure.

4,150,798

CORD AND LINE STORAGE REEL

Manuel Y. Aragon, 125 Grijalva Dr., San Francisco, Calif. 94132

Filed Aug. 10, 1977, Ser. No. 823,413
Int. Cl.² B65H *75/38*
U.S. Cl. 242—100.1 **2 Claims**



1. In a storage reel suitable for storing electric cord, rope, lines and tubing, the combination comprising:

a pair of circular reel half sections comprising a first reel half section and a second reel half section telescoped together, providing a storage reel,

said first reel half section having an integral hub member, circular in shape, said reel half section having a first slot aperture bisectingly disposed the full diameter across said first half section and having a required slot width, said first half section having a flexible rim with a groove formed in and disposed around the full rim periphery,

said second reel half section having an integral hub member, circular in shape and mating with said first half section hub member, said second reel half section having a second slot aperture bisectingly disposed across the full diameter of said half section including aforesaid hub member, said second reel half section having a flexible rim with a groove formed therein and disposed around the full jam peraphejic

aforesaid flexible jims of said first half section and said second section sections are sized and adapted to telescope together and lock the paar of jim grooves of said first and second half sections,

aforesaid integral hub members of said first half section and said second half section are sized and adapted to telescope together and mate, and provide a pair of a first and second slot apertures of equivalent width, and,

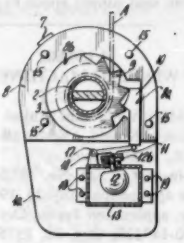
whereby when aforesaid first reel half section and aforesaid second reel half section are telescoped together, mating aforesaid flexible rims and aforesaid hub members, and the pair of reel half sections are rotated to place aforesaid pair of first and second slot apertures in coincidence, and after placing an electric cord across aforesaid slot first and second apertures and aforesaid mated hub members, the mated first reel half section is rotated in an opposed direction to aforesaid second reel half section winding said cord inside said storage reel.

4,150,799

ACCELERATION RESPONSIVE AUTOMATIC LOCKING SAFETY BELT RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1978, Ser. No. 901,049
Claims priority, application Japan, May 17, 1977, 52-055966
Int. Cl.² B62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **10 Claims**



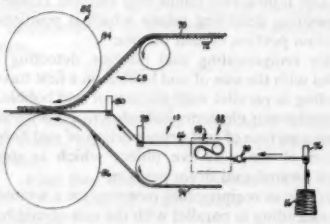
5. An automatic braking safety belt retractor comprising a reel rotatable in opposite belt extraction and retraction directions, a peripherally toothed wheel coupled to and rotatable with said reel, guide means defining a linear guide groove extending along a direction parallel to a tangent to the periphery of said wheel and a pair of first and second stop faces, a stop member slidably engaging said guide groove and longitudinally movable between a retracted position engaging and restricted by said first stop face against further retraction and an advanced position engaging and restricted against further advance by said second stop face and including a transverse projection movable with said stop member alternatively to a wheel disengaged position with said stop member in its retracted position and to a wheel engaging position with said stop member in advance of its retracted position, and condition responsive means for advancing said stop member to a projection wheel engaging position.

4,150,800

STRING TYPE ADHESIVE DISPENSING SYSTEM

Victor H. Clausen, and Charles E. Asbury, Jr., both of Vancouver, Wash., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed May 8, 1978, Ser. No. 903,857
Int. Cl.² B65H *49/02*
U.S. Cl. 242—131 **21 Claims**



1. Apparatus for dispensing a plurality of string members from associated supply spools to a machine wherein string members are applied to a moving web, said machine acting to pull or draw the string members from said dispensing apparatus, comprising:

(a) a dispensing rack on which may be mounted a plurality of supply spools of string members;

(b) means on said dispensing rack for applying drag on the

string members in resistance to pull on said string members by said machine;

(c) means for simultaneously regulating the tension on each of said string members, said regulating means disposed on said dispensing rack to receive said string members from said drag means;

(d) guide means connected to said machine for guiding said string members from said tension regulating means to the moving web; and

(e) means on said dispensing rack for guiding said string members from said supply spool to said drag means.

4,150,801

AUTOMATIC WINDING MACHINE FOR WIRE-LIKE OBJECT

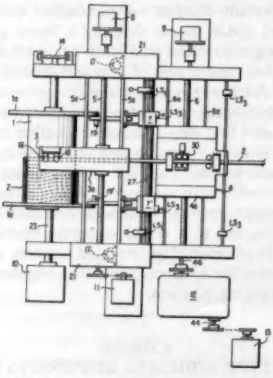
Yoshio Ikegami, Miki; Yoshihumi Mukai; Hidehumi Satoh, both of Kobe, and Koichi Kondo, Akashi, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 737,539, Nov. 11, 1976, abandoned. This application May 23, 1978, Ser. No. 908,778

Claims priority, application Japan, Oct. 30, 1975, 50-131973; Oct. 30, 1975, 50-149229; Oct. 30, 1975, 50-149230; Jan. 21, 1976, 51-6193

Int. Cl.[2] B65H *54/28*

U.S. Cl. 242—158 R **10 Claims**



1. An automatic winding machine for winding a wire-like object such as an electric wire around a drum portion of a bobbin in multiple closely packed layers, which comprises:

a wire-like object position detecting means;

a first synchronizing mechanism attached to said detecting means;

at least one hold-down contacting element connected with said position detecting means which is positioned above said drum portion of said bobbin;

means for reciprocating said position detecting means in parallel with the axis of said bobbin on a first traverse shaft extending in parallel with the axis of said bobbin, wherein said contacting elements hold-down the wire-like object against a surface of said drum portion of said bobbin in the position of the wire-like object which is about to be wound around said drum portion;

traverser means reciprocably mounted on a second traverse shaft extending in parallel with the axis of said bobbin and connected with said first traverse shaft through which said wire-like object is fed and a second synchronizing mechanism connected with said traverser means for moving said traverser means in synchronism with said wire-like object position detecting means; wherein said first synchronizing mechanism allows for movement of said wire-like object position detecting means in synchronism with said traverser means; and

lifting means connected to said wire-like object position detecting means and said traverser means for ascending and descending said wire-like object position detecting means and said traverser means in a vertical direction which is perpendicular to the axis of said bobbin.

4,150,802

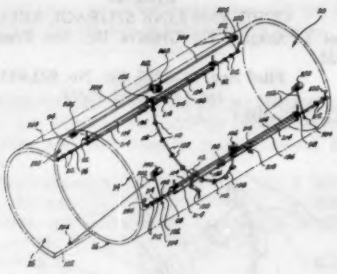
AIRCRAFT ENGINE INSTALLATION

George B. Evelyn, Bellevue, and Varnell L. James, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 31, 1977, Ser. No. 801,546

Int. Cl.[2] B64D *29/00*

U.S. Cl. 244—54 **33 Claims**



1. In a jet propelled aircraft wherein ambient air is supplied to a gas turbine engine by air inlet means extending forwardly of said gas turbine engine, said gas turbine engine supplying exhaust gasses to exhaust system means extending rearwardly of said gas turbine engine for discharging said engine exhaust gasses as a rearwardly directed fluid stream for propelling said aircraft, an improved engine installation configured and arranged for substantially isolating said gas turbine engine from the static and dynamic loading forces exerted by said air inlet means and said exhaust system means, said improved engine installation comprising:

a structural cowling rigidly affixed to said aircraft and depending therefrom for receiving and bearing substantially all said static and dynamic loading forces exerted by said air inlet means and said exhaust system means, said structural cowling having forward and rearward faces respectively including mounting means for receiving and supporting said air inlet means and said exhaust system means, said mounting means being configured and arranged to couple substantially all of said static and dynamic loading forces exerted by said air inlet means and said exhaust system means to said structural cowling, said structural cowling including a central opening extending between said front and rear faces; and

engine mounting means for supporting said gas turbine engine within said central opening of said structural cowling with said gas turbine engine in fluid communication with said air inlet means and said exhaust system means, said engine mounting means being structurally distinct from and independent of said mounting means for receiving and supporting said air inlet means and said exhaust system means.

4,150,803

TWO AXES CONTROLLER

Carlos P. Fernandez, 8692 Rath Cir., Huntington Beach, Calif. 92646

Filed Oct. 5, 1977, Ser. No. 839,647

Int. Cl.[2] B64D *37/00*

U.S. Cl. 244—135 A **12 Claims**

1. An apparatus for controlling a mechanical element in angular or translational position, comprising:

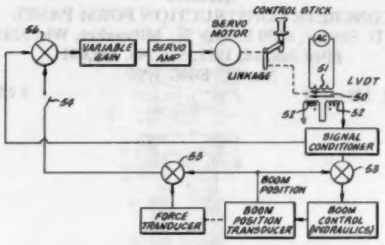
a control stick;

position transducer means driven by said control stick for

generating a command signal that is a function of said control stick position;

actuator means responsive to said command signal for driving said mechanical element;

servo motor means for receiving said command signal and applying an inverse force to said control stick proportional to said command signal;



force transducer means for measuring force on said mechanical element and generating a force signal that varies as a function of said force, and;

switching means for selectively adding said force signal to said command signal applied to said servo motor;

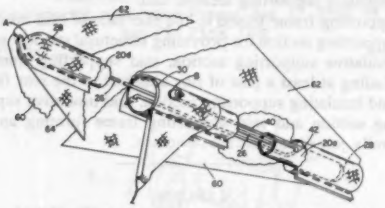
whereby the force on said control stick varies inversely as a function of said stick position alone or stick position in conjunction with the force on said mechanical element depending on said switching means position.

4,150,804

COLLAPSIBLE KITE

Richard R. Jackson, Eight Trinity Rd., Marblehead, Mass. 01947

Filed Oct. 11, 1977, Ser. No. 840,540
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—153 R **4 Claims**



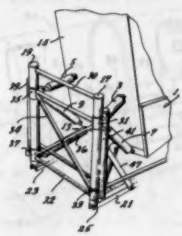
1. In a ready-to-fly, heavier than air kite having a single spar in the form of a central, longitudinal stiffening element extending over the axial length of the kite, and a flexible kite body of sheet-form material extending laterally without support by additional stiff elements from said stiffening element to opposite sides thereof to define a pair of flexible wings, each wing capable of assuming a billowed form during flight, the improvement wherein said single, central stiffening element is comprised of a plurality of elongated stiff sections, said sections connected together to fold relative to one another at a joint from an extended position in which said sections are axially aligned, end to end, to a folded position in which said sections lie side by side, said stiffener sections being permanently installed relative to the respective sections of said flexible kite body that correspond in axial position to said stiffener sections, said flexible kite body portions being free from restraint to permit folding of said flexible kite body sections with said stiffener sections, and said flexible kite body sections being free from lateral restraint to permit wrapping of said kite body sections together about the folded group of stiffener sections to provide a compact portable collapsed kite package, whereby said kite is ready to fly by the simple steps of unfolding the collapsed kite, and bringing said stiffener sections into axially aligned relation, the kite body portions thereupon being free to billow out from said central element.

4,150,805

CRASH SURVIVABLE SEAT

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Inc., West Covina, Calif.

Filed Oct. 20, 1976, Ser. No. 734,362
Int. Cl.[2] B64D *25/04*
U.S. Cl. 244—122 R **6 Claims**



3. A crash survivable seat for aircraft comprising:

a seat bucket;

a carriage secured to said aircraft, said seat bucket being attached to said carriage;

a plurality of energy absorbing means connected between said seat bucket and said carriage, said energy absorbing means comprising upper energy absorbing means, lower energy absorbing means, and intermediate energy absorbing means, the latter comprising first rupturable means responsive to initial crash induced forces for transfer of force to said seat only until a predetermined maximum value of force has been reached, second elastically deformable means responsive to crash induced seat displacement for absorption of energy thereafter at a substantially constant force below said predetermined maximum value of said first energy absorbing means, and third elastically deformable means responsive to crash induced seat displacement for absorption of energy at a substantially constant force below said predetermined maximum value of said first means, and different from the force at which said second means absorbs energy, said upper and said lower energy absorbing means being operable to absorb energy in both tension and compression and having the capability of absorbing energy at all times during crash induced motion, said plurality of energy absorbing means being connected between said seat bucket and said carriage at such different angles as to provide for energy absorption upon displacements in a vertical, fore-and-aft or laeral direction.

4,150,806

VEHICLE RETAINER FOR THERMOS BOTTLES

Vincent B. Dziuk, 8224 - 89th Ave. North, Brooklyn Park, Minn. 55445

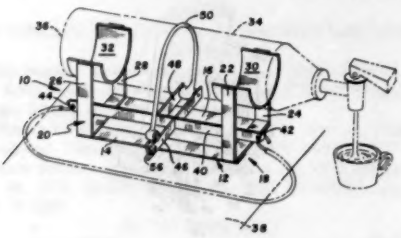
Filed Dec. 5, 1977, Ser. No. 857,787
Int. Cl.[2] A47G *23/02*
U.S. Cl. 248—154 **1 Claim**

1. A vacuum bottle retainer for holding said bottle in a predetermined position within a vehicle, comprising:

(a) a generally rectangular base member comprising first and second elongated strips disposed in a parallel, coplanar, spaced apart relationship and having a first pair of support members rigidly connected proximate one end thereof and extending upwardly therefrom for a first predetermined distance and a second pair of support members rigidly connected proximate the other end thereof and extending upwardly therefrom for a second predetermined distance

greater than said first predetermined distance, said support members each comprising generally "U"-shaped brackets having parallel, spaced apart legs integrally formed with a connecting cross member, said cross member being attached between said first and second elongated strips, said base member further including a median rib extending between and affixed to said cross members of said "U"-shaped brackets;

(b) first and second cradle members disposed between said parallel, spaced apart legs of said first and second pairs of support members, respectively, and shaped to generally



conform to the outer peripheral surface of a vacuum bottle;

(c) a first flexible strap secured at one end to said base member at a point intermediate said first and second pairs of support members and of a length sufficient to pass around the outer periphery of said vacuum bottle when said bottle is resting in said first and second cradle members and connect to said base member; and

(d) a second flexible strap member having first and second ends thereof adapted to be coupled to opposed ends of said median rib for securing said vacuum bottle retainer to a vehicle seat.

4,150,807

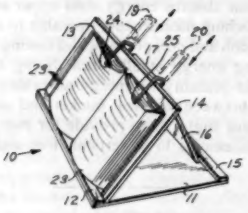
BOOK HOLDING DEVICE

Hipolito S. Manso, 95 Ten Eyck Walk, Brooklyn, N.Y. 11206

Filed Jun. 9, 1977, Ser. No. 805,080

Int. Cl.[2] A47B *97/04*

U.S. Cl. 248—452 **1 Claim**



1. A book holding device, comprising, in combination, a rectangular, horizontal base, a strip secured upon a forward edge of said base, a second strip secured upon a rear side of said base, a rectangular panel rested in inclined position upon said base, a lower edge of said panel abutting against the first said strip, an upper rear portion of said panel having a plurality of spaced apart blocks secured thereto, an upper edge of a brace selectively abutting against a lower edge of either of said blocks, a lower edge of said brace abutting against the second said strip at said rear edge of said base; a pair of spaced-apart, inverted "U"-shaped wire hooks extending around an upper edge of said inclined panel, one leg of each said hook being slidably supported in a bracket mounted on said panel rear side, the other leg of each said hook being forwardly of a front side of said panel for retaining an open book between said panel front side and said hook other legs, and a spring being secured to one of said hooks, at an end of said other leg, said spring engaging a surface of a page of said opened book having only a few other pages therebehind, at either a right or left side of said book.

4,150,808

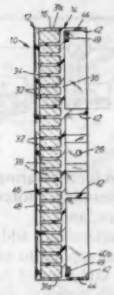
CONCRETE CONSTRUCTION FORM PANEL

Robert D. Sawyer, 9550 S. 60th St., Milwaukee, Wis. 53132

Filed Jan. 16, 1978, Ser. No. 869,681

Int. Cl.[2] E04G *9/10*

U.S. Cl. 249—111 **9 Claims**



1. A removable concrete form for use in casting concrete, the removable concrete form comprising:

a monolithic insulative supporting section having a front face and a rear face and having a pair of parallel spaced apart side walls, spaced apart transverse top and bottom walls, and a plurality of intersecting partition walls forming a lattice in said supporting section;

insulative material located in said lattice;

a planar face plate secured against the front face of said insulative supporting section; and

a supporting frame joined to the rear face of said insulative supporting section for providing structural support to said insulative supporting section, said supporting frame including at least a pair of ribs attached to the rear face of said insulating supporting section, said insulative supporting section and said supporting frame forming an integrally joined monolithic structure.

4,150,809

VALVE DEVICE FOR DRAINING LIQUIDS

Helmut Muller, Bochum, Fed. Rep. of Germany, assignor to Siegfried Kiefer, Fed. Rep. of Germany, a part interest

Filed Apr. 15, 1977, Ser. No. 787,866

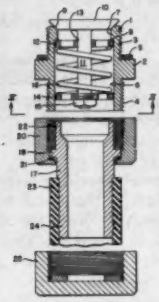
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616803

Int. Cl.[2] F16L *37/28*

U.S. Cl. 251—149.4 **3 Claims**

1. A valve for draining liquids from an enclosure having a threaded opening, said valve comprising a tubular valve casing having an externally-threaded end portion adapted to be threaded into said threaded opening in said enclosure, said tubular valve casing having a conical valve seat at one internal end thereof, a valve element having a beveled seating surface engageable with said valve seat to prevent the flow of fluid through said valve casing, said valve element including an axially-extending solid valve stem, a first guide disc having fluid conducting apertures outwardly of a central bore receiving said solid valve stem, said valve casing further having a shoulder formed on the inner periphery thereof to support said first guide disc against movement toward said valve seat, a second guide disc having fluid conducting apertures outwardly of a central opening, said valve stem having a reduced diame-

ter end portion forming an annular shoulder at the end of said solid valve stem opposite said valve element to support said second guide disc by the central opening thereof, fastening means engaging said reduced diameter end portion of the valve stem to secure said second guide disc thereto, a compression spring interposed between said first and second guide discs and within said valve casing to urge said valve element into engagement with said conical valve seat, a pressing sleeve insert-



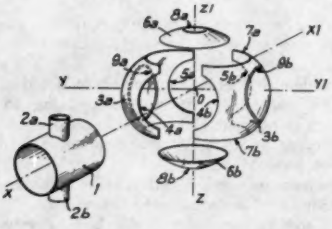
able into the end of said valve casing which is opposite to the end having said valve seat, and cap nut means surrounding said pressing sleeve and operatively connected thereto, said valve casing and said cap nut means having threaded portions for feeding movement of the pressing sleeve into engagement with the second guide disc to unseat the valve element and permit liquid to flow through said valve casing and around said compression spring and through said pressing sleeve.

4,150,810

MACHINE WELDED OBTURATOR

Raymond A. Laignel, Ginestas, and Patrick F. Mommeja, Arles, both of France, assignors to Constructions Metalliques de Provence, Levallois Perret, France

Filed Jun. 22, 1976, Ser. No. 698,675
Claims priority, application France, Jun. 17, 1975, 75 20997
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—309 **4 Claims**



1. An obturator of generally spherical shape for a spherical rotary plug valve comprising:

a tube having a longitudinal axis and two opposite ends defining a conduit passing through the obturator;

an envelope of generally spherical shape having diametrically opposed openings formed therein and surrounding said tube, said envelope being welded at said openings therein to the ends of said tube;

and means for driving said tube and said envelope in rotation about an axis perpendicular to the axis of the tube,

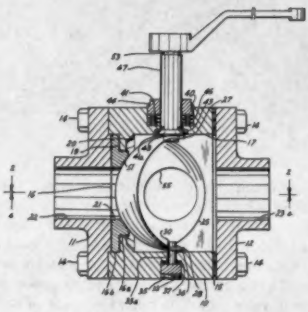
said envelope including an outer surface having two diametrically opposed circular bearings thereon arranged on a diametrical axis extending perpendicular to the axis of rotation and to the axis of the tube, said bearings comprising metal annular surfaces machined with precision on said sheet material to follow a spherical surface and serve as a support for fluid-tight seals when the obturator is closed; the space between the tube and the envelope being filled with a material which is poured in this space then expanded and solidified in place by heating the spherical envelope, so that the latter is pre-stressed in tension after cooling.

4,150,811

VALVES

Paul A. Condit, 10623 Windriver Dr., Houston, Tex. 77070

Filed Aug. 23, 1976, Ser. No. 716,516
Int. Cl.[2] F16K *5/06*
U.S. Cl. 251—315 **5 Claims**



1. A valve comprising:

a valve body having

a central body portion having a chamber therein and oppositely disposed open ends,

flange elements closing the open ends of the central body portion having flow ports which lead to the chamber, and

a seat around the inner end of one of the flow ports;

a closure element supported within the chamber for rotation about an axis to open and close the valve comprising a semispherical shell having

a portion of its outer surface slidably engaged with the seat

a flow opening which may be rotated into and away from registration with the one flow port in said valve body,

a circular opening through the shell at one side, and

a rectangular opening through the shell at the opposite side with its longer dimension directed parallel to the flow opening;

cylindrical shaft means mounted with said valve body concentric with the axis of rotation and closely received within the circular opening of said closure element; and means extending through said valve body on the side opposite the side mounting said cylindrical shaft means for rotating said closure element about the axis to open and close the valve having square shaft means centered on the axis of rotation and received within the rectangular opening of said closure element whereby said closure element is movable toward and away from the seat when said closure element is in the closed position.

4,150,812

LOAD EQUALIZING BAIL ASSEMBLY

George B. Baron, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 21, 1977, Ser. No. 844,494
Int. Cl.[2] B66D *1/36*
U.S. Cl. 254—190 R **11 Claims**

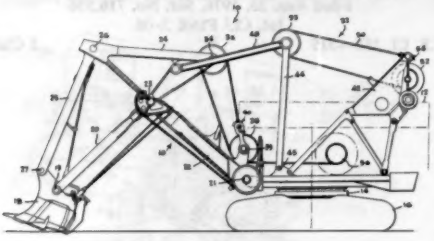
1. In a rope drive a bail assembly for anchoring two ropes

and forming four rope lines extending to and from the bail assembly comprising:

a frame structure,

a pair of sheaves rotatably mounted in said frame structure for anchoring and changing the direction of motion of said ropes,

a double eccentric shaft journaled into said frame, each of said sheaves being mounted for rotation on one of the throws of said eccentric for equalizing the total pulling force between said two ropes and



rope guide means having a pair of entrances and a pair of exits all of which are in the same plane, which receive said ropes and from which said ropes extend, said rope guide means including descending grooves for guiding each said rope from the plane of said entrances to the respective planes of a said sheaves and ascending grooves for guiding said wire ropes from the planes of each of said sheaves to the plane of said exits.

4,150,813

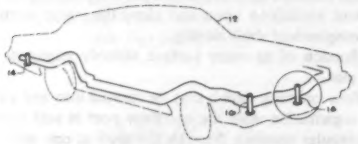
JACK SYSTEM FOR VEHICLE

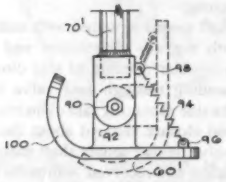
Amado Mena, 1850 SW. 30 Ave., Miami, Fla. 33145

Filed Aug. 25, 1977, Ser. No. 827,711

Int. Cl.[2] B66F *7/04*

U.S. Cl. 254—86 H **1 Claim**





1. In combination, a vehicle and a jack system to selectively raise and lower a selected portion of the vehicle, said vehicle including a power steering pump and said jack system comprising:

a first hydraulic jack and a second hydraulic jack, each of said jacks having a vertically oriented longitudinal centerline, and each jack including a fixed cylindrical portion and a movable piston portion, said cylindrical portion including a closed upper end and a closed lower end, said closed lower end having an axial opening and said piston portion including a vertically downwardly extending rod telescopically passing through said opening, and said cylindrical portion including an upper port and a lower port adjacent the closed upper and closed lower ends respectively; means to mount each of said jacks to the vehicle at spaced locations;

said rod having an outer terminal end comprising a foot to apply a lifting force to the vehicle when the rod is extended on movement of said piston, wherein said terminal end is pivotally mounted to said rod and spring means are provided to urge said terminal end into a predetermined position and yieldable upon vertically applied forces to rotate about said pivot; and

a hydraulic system including a reservoir, said power steering pump and said pump including valve control means, and conduit means connecting the pump to the upper port and lower port of each jack and to the reservoir, said control means being effective to deliver fluid pressure to selectively raise or lower said foot;

said outer terminal end comprising a foot including an enlarged portion defining a peripheral skirt and means connecting the enlarged portion to the terminal end of said rod and said means to mount comprising a bracket means about said cylinder.

4,150,814

ELECTRIC FENCE POST AND INSULATOR HOLDER

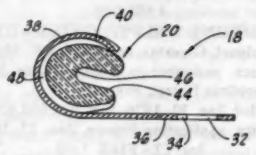
Ruth D. Warren, and Stephen F. Warren, both of 115 N. Pine, Pratt, Kans. 67124

Filed Nov. 15, 1974, Ser. No. 524,070

The portion of the term of this patent subsequent to Oct. 24, 1994, has been disclaimed.

Int. Cl.[2] A01K *3/00*

U.S. Cl. 256—10 **12 Claims**



1. A fence post and insulator holder for an electric fence, comprising:

(a) a post having a ground engaging portion on one end and a means to mount an insulator holder on an opposite normally upper end portion,

(b) an insulator holder having a means to mount an insulator on one end portion thereof and having an aperture through its opposite end portion to receive said post and constructed and adapted to be mounted in depending relation on said post,

(c) an insulator mounted in said means to mount an insulator, said insulator having means to mount a wire,

said fence post and insulator holder being constructed and adapted to be used with other similar fence posts and insulator holders and a wire to form an electric fence along a fence line wherein said posts are positioned in an alternating fashion on opposite sides of the wire and said insulator holders are positioned in a facing relation toward the fence line with said insulators being mounted with the wire.

4,150,815

PIPE FITTING RECONDITIONING APPARATUS

Jim W. Srp, Jr., Corpus Christi, Tex., assignor to Sun Petroleum Products Company, Philadelphia, Pa.

Filed Nov. 2, 1977, Ser. No. 847,875

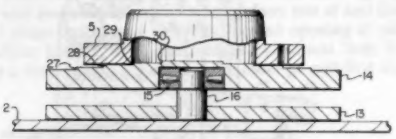
Int. Cl.[2] B23K *7/04*

U.S. Cl. 266—57 **3 Claims**

1. A system for refurbishing used pipe fittings:

(A) a fitting support member including:

(i) a stationary base;
(ii) a platform including an upper surface having a plurality of graduated circular steps increasing in height from an outermost step to an innermost step;
(iii) means rotatably supporting said platform above said base; and
(iv) means for controllably rotating said platform;
(B) a torch support member including:
(i) an upright standard; and



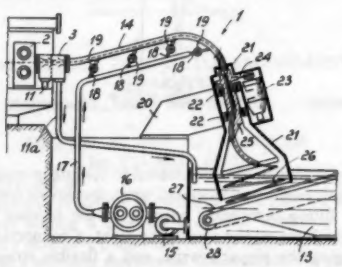
(ii) torch holding means fixed to said standard;
(C) means for juxtaposing said torch support member with respect to said fitting support member; and
(D) an adapter for supporting a pipe fitting, said first adapter including:
(i) a base member adapted to fit over and rest upon one of said circular steps; and
(ii) upwardly extending means supported by said base member and adopted to receive and hold a pipe fitting.

4,150,816

APPARATUS FOR COLLECTING AND COOLING HOT WIRE ROD

Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy (20100)

Division of Ser. No. 309,877, Nov. 27, 1972, abandoned. This application Jul. 28, 1977, Ser. No. 821,944
Claims priority, application Italy, Dec. 2, 1971, 31970 A/71
Int. Cl.[2] C21D 9/56
U.S. Cl. 266—106 **2 Claims**



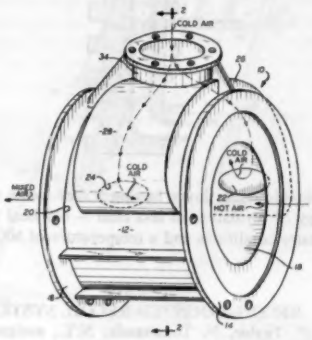
1. An apparatus for collecting and cooling hot wire rod or the like at the output of a rolling mill, comprising a coiler for the formation of coils arranged near the output of the rolling mill, a conveying means arranged to receive the coils formed by the said coiler and to carry them to a collecting unit where the coils are collected to form skeins or the like, said conveying means having at least a first portion immerged and movable in a cooling liquid and a second portion extending outside said cooling liquid, a bell-shaped housing surrounding said coiler and immerged in said cooling liquid above said first portion of said conveying means to establish an air-tight closure between said first portion of said conveying means and said coiler, and air-tight guide means for said wire rod between the output of the rolling mill and said coiler.

4,150,817

MIXING CHAMBER

Donald H. Regelin, Pittsburgh, and Jerome A. Farrar, Ambridge, both of Pa., assignors to Zimmermann & Jansen, Inc., Glenshaw, Pa.

Filed Feb. 6, 1978, Ser. No. 875,560
Int. Cl.[2] C21B 9/10
U.S. Cl. 266—139 **3 Claims**



1. A mixing chamber for mixing hot blast exiting from a hot blast stove with cold blast from a supply thereof to produce a uniform temperature blast mixture adapted to be introduced into a blast furnace comprising,
(a) an open ended tubular member defining openings at opposite ends thereof, one of said openings being an entry into the tubular member and the other being an exit therefrom, said entry being adapted to have introduced therein said hot blast exiting from a hot blast stove, said exit being adapted to communicate with said blast furnace,
(b) said tubular member including a tubular peripheral wall having a pair of circumferentially spaced passageways therethrough substantially diametrically opposite to each other and of substantially oval cross section,
(c) each of said passageways being oriented tangentially to the inner surface of said peripheral wall,
(d) conduit means, defined by a pair of jackets generally concentric with said tubular wall, in fluid communication with said passageways, respectively, for introducing cold blast therein from a cold blast supply,
(e) whereby the incoming cold blast has imparted thereto a swirling motion for thorough mixing thereof with the hot blast entering said tubular member through said entry thereto to produce a uniform temperature blast mixture adapted to pass through said exit opening on its way to said blast furnace.

4,150,818

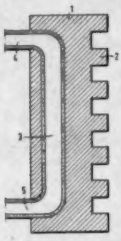
COOLING ELEMENT FOR A METALLURGICAL FURNACE

Hans-Eugen Bühler, Rheurdt; Günter Robusch, Essen; Herbert Schäfer, Dinslaken, and Karl-Heinz Peters, Duisburg, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. Augus Thyssen-Hütte, Duisburg, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 896,794
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717641; Apr. 29, 1977, 2719166
Int. Cl.[2] C21B 7/10
U.S. Cl. 266—193 **14 Claims**

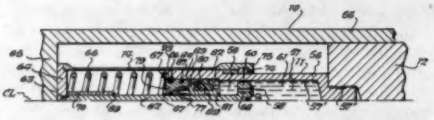
1. In a cooling element for a metallurgical furnace provided with steel tubes to convey a cooling medium, in which the steel tubes are integrally cast into a cast iron body with a metallic layer thereon, and in which the improvement comprises:
a combination of a metallic layer and a stable metallic oxide layer;

said metallic layer being composed of a metal selected from the group consisting essentially of Ni, Co, Mn and Ag, either individually or including two or more; and



said metallic oxide layer having a free oxide standard enthalpy of formation of less than −145 kcal with normal pressure conditions and a temperature of 600° C.

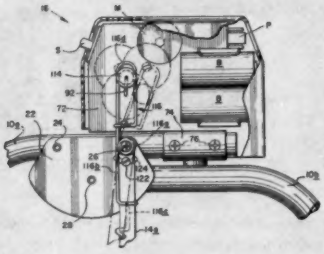
4,150,819
RECOIL-COUNTER-RECOIL SYSTEM
Douglas P. Taylor, N. Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.
Filed Oct. 25, 1977, Ser. No. 844,922
Int. Cl.[2] F16F *9/32, 19/02*
U.S. Cl. 267—136 **25 Claims**



1. A recoil-counter-recoil system for absorbing energy of a body moving in first and second opposite directions during recoil and counter-recoil, respectively, comprising a base, first energy absorber means mounted relative to said base for absorbing the recoil energy of said body during movement of said body in said first direction toward said base, second energy absorber means mounted on said base, coupling means for coupling said second energy absorber means to said body when said body moves in said second direction, said second energy absorber means comprising an elongated resilient member stretchable in said second direction for absorbing the energy of counter-recoil of said body as a result of being stretched by movement of said body in said second direction.

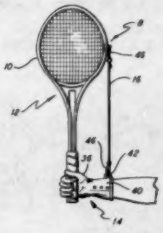
4,150,820
MOTORIZED SWING
Carl E. Bochmann, Brecksville, Ohio, assignor to Hedstrom Co., Bedford, Pa.
Filed Jun. 13, 1977, Ser. No. 805,693
Int. Cl.[2] A63G *9/16*
U.S. Cl. 272—86 **12 Claims**

1. A child's motorized swing comprising
A. a frame,
B. a seat,
C. a pair of elongated rigid hangers connected to opposite sides of said seat,
D. pivots connecting said hangers to the frame so that said seat can swing relative to the frame,
E. a flexible resilient member projecting from one of said hangers adjacent to its pivot to the frame, said flexible resilient member comprising
1. a lever having two ends and a fulcrum located intermediate said ends at said one hanger pivot, said lever end being connected to said one hanger below its said pivot and the other lever end extending perpendicular to said one hanger pivot and being deflectable, and
2. a coil spring engaged on said one hanger pivot, and
F. a motor unit mounted on the frame adjacent said member, said motor unit including an actuator which applies periodic impulses to said other lever end that deflect said other end in opposite directions about said one pivot so



that when said other end is deflected in one direction about said one pivot, said coil is tightened and when said other end is deflected in the opposite direction about said one pivot said coil is loosened whereby there is a preferential coupling of impulses to said hangers which sustain the hangers and the seat supported thereby in oscillation at a frequency determined primarily by the length of the hangers and the mass of the seat and its contents.

4,150,821
TENNIS TRAINING DEVICE
Gabor B. Racz, 255 Robineau Rd., Syracuse, N.Y. 13207
Filed Jul. 25, 1977, Ser. No. 818,513
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**

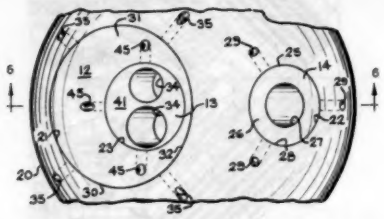


4. A tennis training device adapted to operate in conjunction with a tennis player's racquet and wrist, the device comprising a hinged fitting detachably secured to the racquet head at approximately its widest transverse point, a connection member engaging the player's wrist, and a flexible strap having limited elasticity, the strap being detachably secured at one end to the fitting and at the other end to the connection member whereby it extends between the fitting and member and operates to aid in establishing a desired angular relation between the player's arm and the longitudinal axis of the racquet.

4,150,822
BOWLING BALL ASSEMBLY
Robert P. Beckman, 705 E. Third St., Ottawa, Ohio 45875
Filed Aug. 19, 1977, Ser. No. 826,022
Int. Cl.[2] A63B *37/00*
U.S. Cl. 273—63 B **8 Claims**

1. A bowling ball assembly having a substantially spherical outer surface comprising a spherical major body portion having a smaller cavity and a larger cavity, said smaller and larger

cavities extending symmetrically about angularly displaced axes radiating from the center of said assembly, the arc between said smaller and larger cavities being less than the distance between the end of a thumb and the end of any finger on a hand of a user of said ball assembly, a first plug rotatably fitting into said smaller cavity, a second plug rotatably fitting into said larger cavity, said second plug having a cavity extending symmetrically about an axis radiating from the center of said assembly, a third plug rotatably fitting into said second plug cavity, said first and second and third plugs having rounded outermost surfaces coinciding with and forming segments of said assembly spherical outer surface, one of said first and third plugs including a centrally located opening at said outer surface leading to a substantially cylindrical hole for receiving a thumb from a hand and the other of said first and



third plugs including two substantially cylindrical holes for receiving fingers from such hand, the axis of said second plug cavity being non-coincident with said axis of said larger cavity whereby rotation of said second plug increases the span between said thumb hole and said finger holes, at least one threaded hole extending from said assembly outer surface to the sidewall of said larger cavity, at least one threaded hole extending from said assembly outer surface to the sidewall of said smaller cavity, at least one threaded hole extending from said second plug rounded outer-most surface to the sidewall of said second plug cavity, set screws within said holes which are completely accessible from said assembly outer surface whereby each of said plugs may be releasably secured from rotational and radial movement relative to said major body portion and whereby each of said plugs may be removed from said assembly by releasing engagement of said set screws.

4,150,823

TARGETABLE PROJECTILE AMUSEMENT APPARATUS

David A. Boganowski, 14216 Birchwood Cir., Omaha, Nebr. 68137

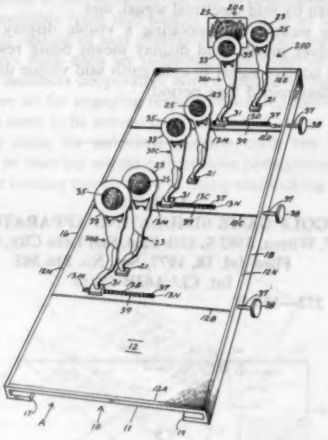
Filed Jun. 10, 1977, Ser. No. 805,528
Int. Cl.[2] A63B *67/04*
U.S. Cl. 273—94 R **13 Claims**

1. Targetable projectile amusement apparatus for an offensive player aiming a physical projectile toward a selected target and a defensive player actively controllably defending a target with a movable mechanical shield capable of protecting a target from being struck by said aimed projectile, said amusement apparatus comprising:

A. A base member having a top-surface extending along a generally horizontal longitudinal-axis and adapted to stably rest upon an underlying substrate, said base member including a pair of longitudinally extending sides including a left-side and a right-side and a pair of transversely extending ends including a front-end and a rear-end;

B. A plurality of targets attached to the base member, each of said targets being adapted to be struck frontally by a physical projectile aimed directionally toward the base member rear-end by the offensive player; and

C. A plurality of shields transversely movably associated with the base member and capable of physically protecting the respective targets from being struck by said aimed projectile, each of said shields including handle means control located outside the base member perimeter and thereat wieldable by the defensive player whereby he



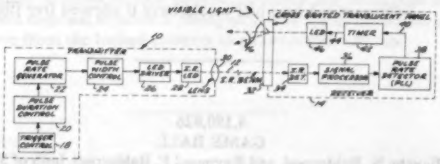
might manually controllably protect the respective said targets from being struck by the offensively aimed projectile.

4,150,824

OPTOELECTRONIC COMMUNICATIONS SYSTEM

Alvaro J. Villa, Northridge, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Aug. 27, 1976, Ser. No. 718,369
Int. Cl.[2] F41G *7/00*
U.S. Cl. 273—101.1 **6 Claims**



1. An optoelectronic communications system, comprising:

transmitter means for transmitting energy substantially in the optical spectrum range, said transmitting means including:

transducer means for converting electrical input energy to energy in said optical spectrum,

pulse generator means for generating electrical power pulses at a predetermined pulse rate and connected as input energy to said transducer means, said pulse generator means including a monostable multivibrator triggered by an oscillator;

pulse train duration control means connected to said pulse generator means for operating said pulse generator means only for a predetermined time duration, said pulse train duration control means including a resistor-capacitor timing circuit with its output connected to the inputs of a NOR gate, the output of the NOR gate being connected to said pulse generator means whereby the charging of said capacitor to a predetermined voltage causes said NOR gate to change state;

receiver means for receiving energy substantially in said optical spectrum range, said receiver means including,

detecting means for detecting energy in said spectrum and generating an electrical signal in response thereto,

pulse rate detection means responsive to said electrical signal

occurring at a predetermined rate, said rate detection means generating a control signal in response thereto, said detecting means including a phase locked loop circuit driven by said electrical signal, and

display means for generating a visible display from said receiver means, said display means being responsive to said control signal to extinguish said visible display for a predetermined time period.

4,150,825

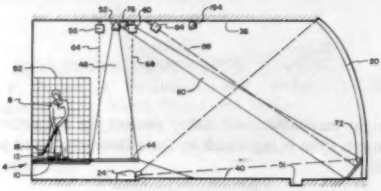
GOLF GAME SIMULATING APPARATUS

Robert F. Wilson, 3363 S. 13th East, Salt Lake City, Utah 84106

Filed Jul. 18, 1977, Ser. No. 816,345

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—185 B **13 Claims**



1. Apparatus for simulating the playing of golf comprising

a support defining a tee area from which a golf ball may be driven by a player utilizing a golf club,

sensor means for detecting the time and horizontal location at which a driven ball passes through each of three planes spaced apart in the direction of travel of the ball, and

logic means responsive to said sensor means for producing an estimate of the distance of travel and ultimate resting position the driven ball would have if allowed free flight.

4,150,826

GAME BALL

Blanche N. Baldorossi, and Raymond F. Baldorossi, both of 3702 Meadowbrook Ave., Orlando, Fla. 32808

Division of Ser. No. 573,773, May 1, 1975, Pat. No. 4,026,561. This application May 26, 1977, Ser. No. 800,843

Int. Cl.[2] A63B *69/36, 37/00*

U.S. Cl. 273—218 **6 Claims**

1. A ball of lightweight construction usable in the game of softgolf, said ball being of a weight in the range from 2.0 to 2.5 ounces, and of a diameter in the range from 4.2 inches to 5.0 inches, said ball having an interior portion of lightweight closed cell resilient foam.

4,150,827

ECONOMIC BOARD GAME

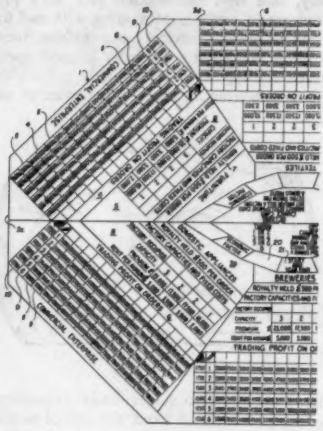
David A. J. Barnett, "Little Ridings", Green End Rd., Radnage, High Wycombe, Buckinghamshire, England

Filed Aug. 19, 1976, Ser. No. 715,730

Claims priority, application United Kingdom, Aug. 19, 1975, 34458/75

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—256 **16 Claims**



1. A game in which the players are involved in a trading situation, trading transactions between the players being determined according to the operation of a plurality of economic determinants, the game comprising:

(a) game mascots;

(b) currency tokens;

(c) a die or dice;

(d) a plurality of sets of cards of at least two kinds, the first kind being economic determinant cards which bear instructions determining the operation of at least one variable economic determinant relating to market transactions undertaken in the course of the game, and the second kind being option cards which bear instructions concerning options open to the player;

(e) a game board having (1) a track divided into a plurality of spaces over which at least one of the game mascots is moved and on which said at least one game mascot is brought to rest, said track representing a predetermined time interval of at least one trading year and including indicia representing the end of the or each trading year, and at least some of said spaces bearing further indicia giving instructions to select one of said economic determinant cards; (2) a plurality of discrete zones bearing indicia representing distinctive enterprises which may be industrial, commercial and/or service enterprises, and including primary areas containing tabulated indicia relating to the values of at least a first economic determinant the or one table of which includes a column containing numerical indicia corresponding to the numerical indicia on the die or dice whereby the number obtained by a throw of the die or dice is related to the operation of said at least one economic determinant, and secondary areas bearing indicia relating to the values of at least a second economic determinant which is independent of said first economic determinant and is also independent of the numerical indicia on the die or dice its operation being determined by the players making a choice at least at the start of the game, and (3) an information zone setting out instructions relating the respective sets of option cards to the numerical indicia on the die or dice; and

(f) means for denoting (1) trading transactions made by the

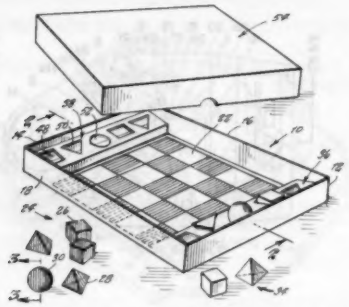
players and (2) the values of variables pertaining at a given time during the course of the game.

4,150,828

CHECKERBOARD GAME

Anthony Marchese, c/o S. Effron, 279 Springtown Rd., New Paltz, N.Y. 12561

Filed Aug. 1, 1977, Ser. No. 820,878
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—260 **6 Claims**



1. A game comprising a square gameboard having a uniform checkerboard playing field throughout, and including an odd number of rows and columns each of which has the same number of playing squares as the other, and two similar sets of playing pieces, each set of playing pieces comprising a total number of pieces equal to said number of rows and including a single playing piece of geometric configuration, and pairs of additional playing pieces to equal said total number of pieces, each pair being of a different geometric configuration from the other pairs and from said single playing piece, the playing pieces of one set being distinguishingly identifiable from the playing pieces of the other set, and further comprising a gamebox for storing the playing pieces, said gameboard forming at least part of the base of said gamebox, said gamebox comprising four sidewalls extending upwardly from the base forming a substantially rectangular gamebox, and a cover positionable over the gamebox, and storage compartments positioned adjacent one pair of opposing sidewalls of said gamebox, said gameboard occupying the space between said storage compartments and the remaining pair of sidewalls, whereby a storage compartment is respectively positioned adjacent opposing ends of said gameboard, each of said storage compartments further comprising a top wall raised above said gameboard, geometrically configured openings formed in said top wall along a single row for respectively receiving therein said playing pieces, each opening respectively positioned adjacent a playing square, the geometrically configured openings respectively corresponding to the geometric configuration of the playing pieces and positioned along said single row in accordance with the initial positioning of the various playing pieces on the gameboard for playing the game.

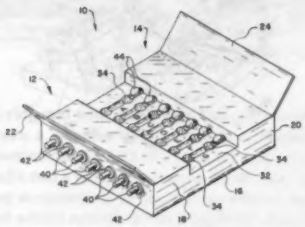
4,150,829

GAME APPARATUS

John A. Cates, 444 Drummond Dr., Raleigh, N.C. 27601

Filed May 9, 1977, Ser. No. 795,208
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—265 **15 Claims**

1. A game device comprising: a game board having at least two distinct and separate playing areas with each playing area including a plurality of passageways; at least two sets of locking tumblers with each set having a plurality of various length locking tumblers, each locking tumbler being adapted to be inserted within a respective passageway and each being of a length less than the length of said passageways and movable therein between an initial locked position and an unlocked position; a plurality of objects normally occupying a locked position outside of and adjacent one end of respective passageways and movable from said locked position to an unlocked position still outside of said passageways; at least two sets of key members with each set including a plurality of various length key members cooperative with a respective tumbler of each tumbler set for engaging respective locking tumblers and causing the same to be moved from said initial locked position to in some cases the unlocked position, each key member adapted to be inserted within a respective passageway behind a respective locking tumbler and to move said locking tumbler



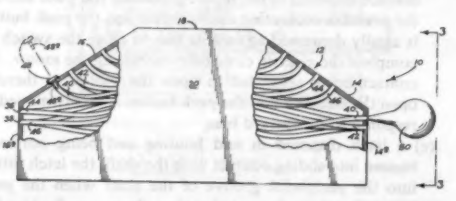
from its initial locked position toward said unlocked position, and wherein where the combined length of a respective key member and tumbler in a respective passageway is equal to or greater than a predetermined length said tumbler will be moved to said unlocked position and will accordingly engage a respective object and move the same to its unlocked position; and wherein one or more of the various key members comprising a key set is of sufficient length to cooperate with less than the total number of locking tumblers of a locking tumbler set to unlock respective objects such that certain key members may or may not be of sufficient length to cause a respective locking tumbler to move to said unlocked position and to engage an object disposed adjacent a passageway and causes the object to move from the locked position to an unlocked position.

4,150,830

AIR TUBE GAME APPARATUS

Marshall E. Sink, P.O. Box 271, Fairview, Oreg. 97024

Filed Feb. 21, 1978, Ser. No. 879,218
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—265 **5 Claims**

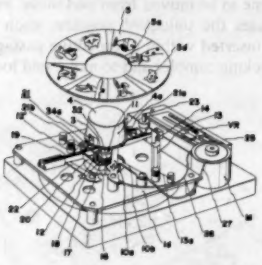


1. Game apparatus for use by opposing players comprising:
a housing having a pair of playing surfaces;
a first array of apertures provided on each playing surface;
a second array of apertures provided on each playing
tubular means detachably interconnecting apertures of said first array on each playing surface with apertures of said second array on the other playing surface.

4,150,831
TOY RECORD PLAYER

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Japan

Filed Oct. 3, 1977, Ser. No. 838,808
Int. Cl.[2] G11B 17/06
U.S. Cl. 274—15 R 7 Claims



1. In a toy record player of the type wherein a record disc having a plurality of recording grooves formed in its lower face and carrying marks representing the recording grooves at its upper face is adapted to be mounted on the record player, the record player including a housing, a tone arm pivotally mounted onto the housing, a stylus carried by the tone arm, one of the marks being alignable with the stylus point to enable the stylus to engage a selected one of the recording grooves for performing sound reproduction, and further wherein the sound reproduction is stopped automatically when the stylus has been driven to the final point of the recording groove, the tone arm returning automatically to the starting position after the stylus reaches the final point of the recording groove, the improvement which comprises:

(a) a motor disposed in said housing and being in electrical communication with a source of energy therefor,

(b) an upwardly extending shaft disposed in the housing and having a peripheral groove formed therein, the shaft having one end emerging therefrom, the emerging end comprising an upwardly biassed axially moveable push button, the push button defining a record holder for the record disc, the push button being operatively connected to the motor to drive the push button and the record disc held thereby,

(c) means for biassing the pushbutton,

(d) a normally open switch interposed the motor and the source of energy, the switch comprising a pair of switch contact disposed in the housing beneath the push button, the contacts contacting each other when the push button is axially depressed against its bias to close the switch to complete the electric circuit for energizing the motor, the contact being separated to open the switch to thereby open the circuit when the push button is axially moved in response to its upward bias;

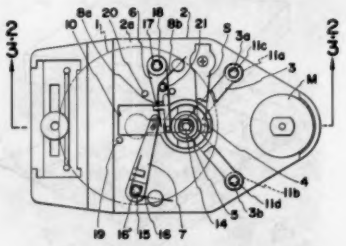
(e) a latch disposed in said housing and being normally biassed into sliding contact with the shaft, the latch fitting into the peripheral groove of the shaft when the push button is axially depressed against the means for biassing to thereby latch the push button in the depressed position, and

(f) an actuating link mounted in the housing proximate the tone arm and the latch, the tone arm acting against the actuating link when the tone arm reaches the final position of sound reproduction to press the link against the latch to disengage the latch from the peripheral groove.

4,150,832
MECHANISM FOR CAUSING RETURNING MOVEMENT OF TONE ARM OF TOY PHONOGRAPH

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Kawasaki, Japan

Filed Nov. 2, 1977, Ser. No. 847,849
Claims priority, application Japan, Jun. 13, 1977, 52-69742
Int. Cl.[2] G11B 17/06
U.S. Cl. 274—15 R 3 Claims



1. A toy phonograph comprising:

a housing including a base;

a rotatable turntable with a record disc mounted on said base and including a center pin extending upwardly at the center of said turntable;

an intermediate sound transmitting body supported at one end thereof above said record disc for movement toward and away from said record disc;

a speaker;

said sound transmitting body being adapted to make sound transmitting contact with said speaker;

a cam disposed on the upper end of said center pin and being adapted to exert a force in the axial direction of said center pin;

a tone arm pivotally secured at one end thereof to a portion of said housing;

a first spring, said tone arm being normally biased by said first spring toward the starting position of a reproduction, adjacent the periphery of said turntable;

the free end of said tone arm being adapted to slidably contact the lower side of said sound transmitting body when said tone arm travels between the starting position and a final position of the reproduction, said tone arm being biased toward said turntable by said sound transmitting body;

a swingable rod supported on a portion of said housing and being adapted to be swung along a plane intersecting the axis of said cam;

a second spring, said swingable rod being normally biased by said second spring in a direction away from said cam;

said swingable rod being pivotally mounted to permit said rod to contact said cam when said rod is moved against the normal biasing force of said second spring, to thereby lift said intermediate sound transmitting body;

said free end of said tone arm being adapted to press said swingable rod against the normal biasing force of said second spring into contact with said cam when said tone arm moves to the final position of the reproduction; and

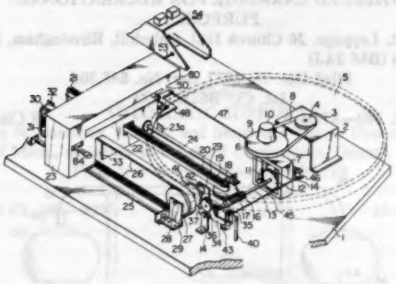
a buffer resilient body adapted to absorb relative movement between said swingable rod and said tone arm when said swingable rod is pressed into contact with said cam, said buffer resilient body comprising a portion of said second spring.

4,150,833

VIDEO/AUDIO DISC REPRODUCING APPARATUS

Takashi Yamamura, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Continuation of Ser. No. 705,442, Jul. 15, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,321
Claims priority, application Japan, Jul. 18, 1975, 50-98964; Jul. 18, 1975, 50-98965; Mar. 29, 1976, 51-38300
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R 5 Claims



1. Apparatus for controlling a transducer assembly with respect to a disc type record medium, comprising:

a first drive belt;

means for driving said first belt at a first speed;

a second drive belt;

means for driving said second belt at a speed higher than said first speed;

first means arranged to couple a transducer assembly to a portion of said first drive belt for providing motion to said assembly toward the center of said disc;

second means arranged to couple said transducer assembly to different portions of said second drive belt for providing motion to said assembly toward and away from the center of said disc;

a loop structure including an inclined working section extending at an angle to the surface of said second belt and movable between first and second positions in coaction with said first coupling means;

a pivot shaft rotatable about the axis thereof;

a resilient finger having a hooked end and projecting through said loop structure from said pivot shaft toward said second belt to an extent that when said loop structure is moved from said first to second positions the hooked end is disengaged from contact with said working section and comes into contact with a portion of said second belt, whereby said hooked end is driven by said second belt so that said pivot shaft is rotated until the hooked end is disengaged from contact with said second belt, and when said loop structure is moved from said second to first positions said finger comes into contact with one end of said working section of said loop structure to provide sliding motion to said finger toward the other end of said inclined working section so that said pivot shaft is rotated in a reverse direction and

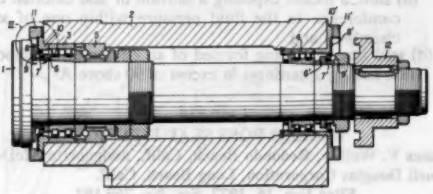
third means to couple said transducer assembly to said pivot shaft such that said transducer assembly is in a raised, noncontact position and a lowered, contact position with the surface of said record medium in response to said loop structure being in said first and second positions, respectively.

4,150,834

FACED-RING SEAL WITH DIAPHRAGM

Bernard Robert, Meudon la Foret, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 1, 1978, Ser. No. 901,631
Claims priority, application France, May 3, 1977, 77 13371
Int. Cl.[2] F16J *15/36, 15/38*
U.S. Cl. 277—88 5 Claims



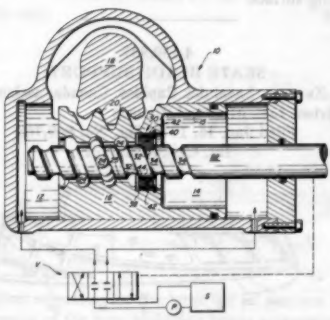
1. A faced-ring seal with diaphragm intended to provide the sealing between a rotating spindle and its stationary support bearing, by mutual flat contact of a rotating faced ring integral with the spindle and a fixed nonrotating faced ring, coupled by a static sealing arrangement to the bearing support and pressed elastically and axially against the moving faced ring, characterized by the fact that the arrangement for elastic application of the fixed faced ring is constituted of an annular diaphragm, initially flat, fastened at its periphery to the said support, and that the static sealing arrangement consists of a flexible elastic annular seal in contact simultaneously with the diaphragm near its inner rim, with a cylindrical bore in the support, and with an outer conical bearing surface on the fixed faced ring opposing its surface of contact with the moving faced ring, the whole being designed so that the friction torquesof the annular seal on the bore and on the fixed faced ring exceed the friction torque of the moving faced ring on the fixed one in order to immobilize the latter in rotation by this effect alone.

4,150,835

GROOVED SHAFT SEAL

Edward A. Wheelock, 641 Schooner Point, Schaumburg, Ill. 60194

Filed Feb. 4, 1977, Ser. No. 765,806
Int. Cl.[2] F16H *55/00;* F16J *15/32*
U.S. Cl. 277—165 9 Claims



1. In a hydraulic cylinder having a rotatable screw extending through one end and a ball bearing nut mounted thereon in sealing engagement with the cylinder walls, a seal means extending between said nut and screw for dividing said cylinder into two expansible fluid pressure chambers on opposite sides of said nut, said seal means including:

(a) an annular ring seal having a threaded aperture extending

therethrough for sealingly mating with the thread of said screw;

(b) said seal having an external circumference in a mating interference fit with the internal diameter of said nut;

(c) said seal including an annular metallic biasing means for biasing said seal into said interference fit; and

(i) annular radially extending reinforcing means for accepting shear imposed axially upon said seal;

(ii) slotted means exposing a portion of said external circumference to the fluid pressure within one of said chambers; and

(d) said ring seal being formed of an elastomeric composition having a hardness in excess of 90 shore A.

4,150,836

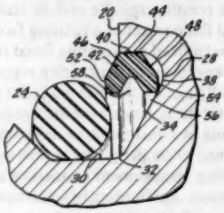
BACKED BOSS SEAL FITTING

James V. Walker, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 16, 1977, Ser. No. 769,182

Int. Cl.[2] F16J *15/26*

U.S. Cl. 277—188 A **15 Claims**



1. A fitting for maintaining a sealed connection with a threaded boss, said fitting including:

a threaded portion for threadably engaging the boss;

a radial boss engaging surface;

a thread relief portion adjacent said threaded portion; and

a cutout portion in said radial boss engaging surface adjacent said thread relief portion, said cutout portion being shaped to receive a backup ring and to retain the ring in a predetermined position against the boss when said fitting is threadably engaged therewith, said cutout portion being defined by a frusto-conical surface concentric to and adjacent said thread relief portion, an annular surface, having a semi-circular cross-section, connected to said frusto-conical surface, and a cylindrical surface which extends from said annular surface to said radial boss engaging surface.

4,150,837

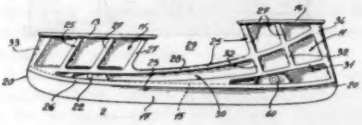
SKATE BLADE SUPPORT

Peter F. Zuuring, Laval des Rapides, Canada, assignor to PFZ Enterprises Inc., Montreal, Canada

Filed Jan. 16, 1978, Ser. No. 869,768

Int. Cl.[2] A63C *1/02*

U.S. Cl. 280—11.12 **11 Claims**



1. A blade support for an ice skate, said support comprising a structural unitary elongated frame constructed of synthetic material and having a vertical wall defining opposed side faces, a transverse top attachment means at an upper end of said vertical wall for securing said frame to an article of footwear, an elongated blade receiving channel in a lower edge of said frame for receiving a top portion of a skate blade, localizing means in said channel to position said blade at a predetermined position therein, securement means for securing said blade in said channel, a plurality of structural ribs extending over said vertical wall to strengthen said vertical wall, said structural ribs being disposed on and extending outwardly of said opposed side faces of said vertical wall, there being at least one elongated structural rib extending along said lower edge, and a plurality of depending structural ribs extending from said transverse top attachment means towards said elongated structural rib.

4,150,838

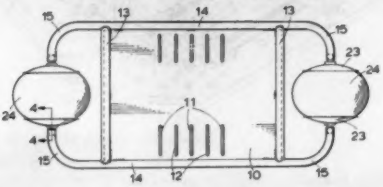
WHEELED CARRIAGE FOR RECREATIONAL PURPOSES

Colin R. Lappage, 26 Church Hill, Coleshill, Birmingham, England (B46 3AJ)

Filed Oct. 25, 1977, Ser. No. 845,306

Int. Cl.[2] B62K *9/00*

U.S. Cl. 280—87.04 A **9 Claims**



1. A wheeled carriage for recreational purposes comprising a platform large enough for a person to stand on with his or her feet side by side, and a single front wheel and a single rear wheel mounted to said platform so as to be capable of rotation about spaced parallel axes and with the centers of the wheels lying in the longitudinal vertical central plane of said platform, the wheels being of rounded profile to enable the platform to tilt laterally in use, the platform being offset above or below the axes of the wheel, whereby the carriage can be used either way up, the platform being above the wheel axes when the carriage is one way up so as to require a high level of skill to maintain the carriage balanced, and the platform being below the wheel axes when the carriage is the other way up so as to require a lower level of skill to maintain the carriage balanced.

4,150,839

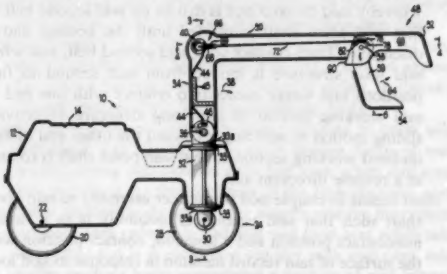
TOY VEHICLE

James E. Tucker, Oak Park, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 4, 1977, Ser. No. 765,794

Int. Cl.[2] A63H *33/30*

U.S. Cl. 280—771 **16 Claims**



1. A toy vehicle, comprising:

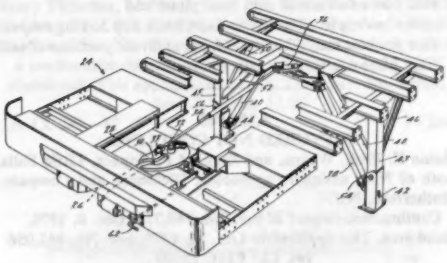
a body;
a seat defined on said body;
a plurality of wheels rotatably secured to said body to support the vehicle for movement over a suitable supporting surface;
steering means rotatably mounted on said body and coupled to at least one of said wheels for steering said vehicle;
an extension arm mounted on said body for selective directional control;
manually actuatable grasping means mounted on said arm for grasping objects; and
means mounting said grasping means for generally vertical movement relative to said supporting surface.

4,150,840

AUTOMATIC SUPPORTS

Tara N. Banerjea, Warren, and Stephen J. Ringe, Detroit, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Filed May 8, 1978, Ser. No. 903,718
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—429 **10 Claims**



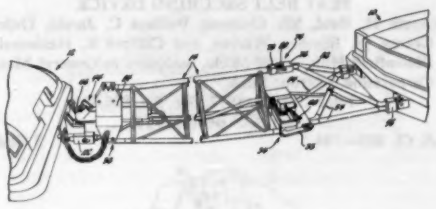
1. A trailer having an upper fifth wheel that is adapted to be coupled to a tractor having a lower fifth wheel, and a kingpin protruding upwardly from said lower fifth wheel, an automatically retractable front undercarriage assembly comprising:
a pair of front support struts having upper and lower members thereof, the upper members being rigidly secured to the frame of said trailer and the lower members thereof being pivotally secured to said upper members such that in the extended position said lower members are aligned with said upper members to support the front end of said trailer, and in the retracted position said lower members are pivoted inwardly with respect to the sides of said trailer;
camming means having a slotted opening therein for receipt of said kingpin as said tractor is backed up to couple with said trailer, the rearward movement of said kingpin causing said camming means to rotate in a first direction about an axis;
a longitudinal rod connected at one end to said camming means such that the rotation of said camming means is translated into fore or aft movement of said longitudinal rod;
a pair of transverse links each connected at one end to one of said lower members of said support struts; and
coupling means connected to the other ends of said pair of transverse links and to the other end of said longitudinal rod for drawing said transverse links inwardly with respect to the sides of said trailer when actuated by the movement of said longitudinal rod so that said lower members of said support struts are pivoted from said extended position to said retracted position.

4,150,841

DUAL-VEHICLE OPERATING SYSTEM

Richard F. Ayotte, Livonia, and Trevor O. Jones, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 812,179, Jul. 1, 1977, Pat. No. 4,119,166.
This application Jun. 28, 1978, Ser. No. 919,773
Int. Cl.[2] B62D *59/04*
U.S. Cl. 280—446 R **2 Claims**



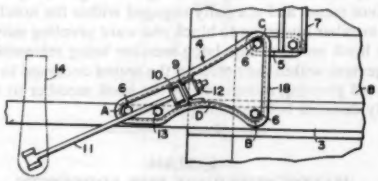
1. A rigid structural link having a longitudinal axis and adapted to be connected between two self propelled vehicles comprising; an input end; pivotal connecting means on said input end; an output end; pivotal connecting means on said output end; means supporting one of said connecting means adjacent one end of said link for movement relative to said link along its longitudinal axis; force sensing means mounted adjacent said one link end and responsive to relative longitudinal movement between said one connecting means and said link resulting from the transmission of force in either direction along the longitudinal axis of said link between the input and output ends thereof; and angle sensing means for determining the angular position of said pivotal connecting means on said input end and said output end relative to said longitudinal axis, and latch means for coupling the output end to the link when a predetermined angle between the output end and longitudinal axis is present to prevent the output end from pivoting toward angular alignment with the longitudinal axis.

4,150,842

FRONT SUSPENSION FOR A MOTOR VEHICLE

Makoto Hamada, and Hiroyuki Watanabe, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1977, Ser. No. 777,666
Claims priority, application Japan, Dec. 23, 1976, 51-173327[U]
Int. Cl.[2] B62D *17/00*
U.S. Cl. 280—661 **6 Claims**



1. A support structure for the strut bar of a motor vehicle front suspension of the type including lower suspension arms, said support structure comprising:
a strut bar bracket provided to the rear of said lower suspension arm and coupled to said motor vehicle at at least two points of a front side member and a floor side member of said motor vehicle and at least one point of a rear support cross member of an engine of said motor vehicle, said strut bar bracket extending over a connecting portion between

said front side member and said floor side member and connected to both of said members;

a strut bar fixed at one end to said lower suspension arm and extending toward said strut bar bracket; and

an adjustable means for coupling a portion of the strut bar remote from said one end to said strut bar bracket whereby the length of said strut bar may be varied.

4,150,843

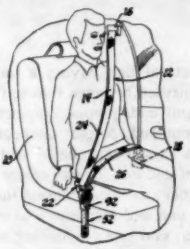
SEAT BELT SECURING DEVICE

Kenneth H. Reid, Mt. Clemens; William C. Jarski, Oxford; George W. Boymer, Warren, and Clifford E. Heidenreich, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1977, Ser. No. 846,511

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—744 **3 Claims**



1. In a vehicle body seat belt system having one belt end anchored at one side of the seated occupant and a loop of belt adapted for securement at the other side of the seat to position the belt in the restraining position about the seated occupant, a securing device at the other side of the seated occupant to releasably capture the belt and comprising: mounting means on the vehicle body generally adjacent the hip of the seated occupant; a hook member having a forwardly opening belt receiving slot defining a lower mounting leg having a latch notch and an upper leg having a belt engaging portion for engagement by the belt upon entry of the belt into the slot; pivot means acting between the mounting means and the mounting leg of the hook member and being arranged relative the belt engaging portion of the upper leg so that force applied against the hook member by the belt maintains the belt engaging portion and belt receiving slot in a downwardly directed belt capturing position; said hook member being rearwardly pivotable to an upwardly directed belt releasing position upon manual pivoting effort applied thereto by the seat occupant to release the belt for movement from the restraining position; and a latch member movably mounted on the mounting means generally adjacent the pivot means and normally engaged within the notch of the hook member lower leg to block rearward pivoting movement of the hook member, said latch member being releasable from engagement within the notch by the seated occupant to permit rearward pivoting movement of the hook member to the upwardly directed belt releasing position.

4,150,844

HANDY NOTEBOOK FOR ADDRESSES

Iwao Yoshizawa, Tokyo, Japan, assignor to Yoshizawa Kobundo, Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,147

Claims priority, application Japan, Aug. 21, 1976, 51-58565

Int. Cl.[2] B42D *3/04*

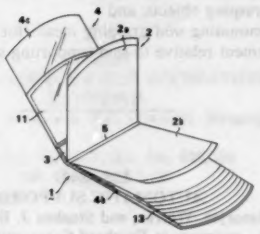
U.S. Cl. 281—19 R **15 Claims**

12. A notebook comprising:

a base plate folded in two so as to form a front portion with a given short length and a rear portion with a longer length;

a plurality of paper record slips, each of which is folded in two at a substantially central transverse fold line thereof so as to form front and rear flaps of substantially the same length;

said paper slips being steppedly and sequentially arranged and attached adjacent each other to the inside surface of said base plate in the vicinity of their respective transverse fold lines, said fold lines of said attached paper slips being arranged adjacent each other along a predetermined length of the inside surface of said base plate;



said base plate including an adhesive outer surface which is removably covered by a protecting sheet, said adhesive outer surface comprising a bonding material coated on said outer surface of said base plate; and

a cover having front and rear flaps, each flap having respective pockets into which said front and rear portions of said base plate are respectively inserted.

4,150,845

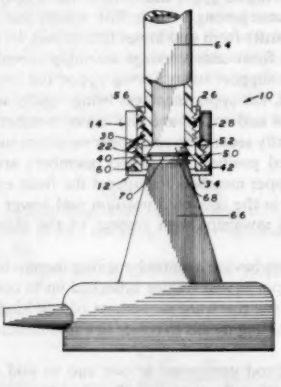
CAPTURED NUT COUPLING

Arduino E. Riuli, Wayne, and Bernard F. Kopacz, Little Falls, both of N.J., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Continuation-in-part of Ser. No. 747,773, Dec. 6, 1976, abandoned. This application Oct. 14, 1977, Ser. No. 842,056

Int. Cl.[2] F16L *19/00*

U.S. Cl. 285—81 **10 Claims**



1. A captured nut coupling for affecting a fluid tight joining of two fluid-carrying articles, which comprises;

(a) a coupling male member characterized by:

(1) a flange around the periphery of the second open end adapted to stop against the third end of the female member described below a one-piece, unitary body having first and second open ends and a first axial bore communicating between said ends;

(2) a split in said body, extending from said first end to said second end, said split upon spreading permitting the expansion of said bore in diameter; and

(3) means on the bore wall of said body for rotatably

mounting said body on a cooperating first article when inserted in the first axial bore;

(b) a coupling female member characterized by;

(1) a body having third and fourth open ends and which defines a second axial bore communicating between said third and fourth ends, said second bore being adapted to receive said male member;

(2) means for connecting said fourth end to a fluid carrying second article; and

(c) means associated with the male and female members for permanently locking said male member in the bore of said female member whereby the spread of said split is prevented and expansion of the first axial bore is prevented, said locking means preventing rotation of the male member relative to the female member and preventing axial movement of the male member in the second axial bore;

(d) whereby when the first end of said male member is mounted and locked in said second bore through said third end of said female member, the captured nut is rotatably secured to the first article and permanently locked thereon.

4,150,846

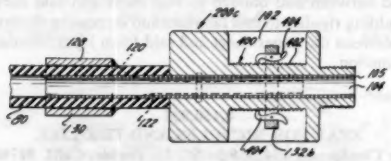
CLAMPING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 658,582, Feb. 17, 1976, Pat. No. 4,062,573, Division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,821

Int. Cl.[2] F16L *33/22*

U.S. Cl. 285—87 **7 Claims**



1. A clamping member for manually attaching one part of a two part hose coupling device to a hose without need for use of a tool, comprising, in combination, a body section having a bore running therethrough, and comprising a first end portion, an intermediate portion and a second end portion, said first end portion being adapted to be connected to one part of a two part hose coupling device; at least a pair of spaced apart clamping rods each pivotally connected to said body section of said clamping member, each of said clamping rods including a clamp section connected at one end of said rod; rod moving means disposed about said body section in contact with said clamping rods, said rod moving means comprising a ring member disposed about said body section of said clamping member; and ring retaining means in communication with said ring member, said retaining means comprising a plurality of engaging means in said body section of said clamping member, and said ring member being disposed over said engaging means, said ring member including latch means pivotally attached thereto, said latch means being adapted to engage said engaging means of said body section to prevent movement of said ring member, so that when a hose is inserted in said second end portion of said body section said rod moving means can be manually positioned so as to force said connecting rods to be pivoted downwardly so that the clamp sections thereof will be forced against said hose and thereby hold said hose in place in said body section and in communication with said one part of said coupling device.

4,150,847

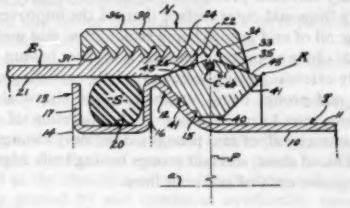
FLEXIBLE TUBE COUPLING WITH SYMMETRICAL ANCHOR RING

Herbert A. De Cenzo, 3719 Cannon Ave., Las Vegas, Nev. 89121

Continuation-in-part of Ser. No. 692,651, Jun. 4, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,305

Int. Cl.[2] F16L *27/02*

U.S. Cl. 285—93 **26 Claims**



1. A flexible fluid conducting coupling for a preformed cylindrical tube end enlarged radially with a peripheral bearing ridge having a shoulder faced away from the tube end and spaced from an end flange by a seat to form an intermediate seal groove; and including, a seal carried in the seal groove, a retaining nut having an inturned flange engageable with clearance over the said end flange and bearing ridge of the tube and having a counterbore terminating at a face of said inturned flange and disposed toward the end of the tube and in spaced relation to and opposing the bearing ridge thereon, a split anchor ring expansible to engage over the said end flange and bearing ridge of the tube and movable through the counterbore into engagement with the face of said inturned flange of the nut and having a wall forming a buttress engageable with the shoulder of the bearing ridge, and a fluid conducting cylindrical coupling body engageable with clearance over the said end flange and bearing ridge of the tube and positioned in the counterbore of the retaining nut and having an end face opposed to the face of said flange of the retaining nut and positionably clamping the anchor ring therebetween.

4,150,848

COUPLING FOR NON-METALLIC HOSE

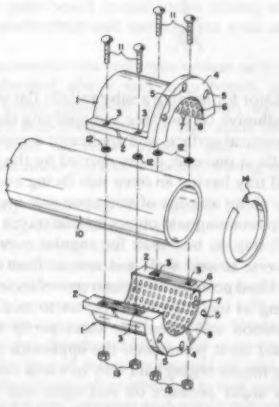
Sven-Erik Dyrup, Oxie, Sweden, assignor to Trelleborg Aktiebolag, Trelleborg, Sweden

Filed Nov. 9, 1977, Ser. No. 850,066

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 7727938[U]

Int. Cl.[2] F16L *33/00*

U.S. Cl. 285—238 **10 Claims**



1. In a coupling for non-metallic hose comprising two semi-

circular coupling halves to receive the outer surface of a hose end therebetween, each of said coupling halves having two diametrically opposed, radially outwardly directed flanges extending axially along the hose coupling and a flange disposed at one end of the hose coupling directed radially outwardly transversely of the axial direction of the hose coupling, each of said coupling halves further having a semi-circular metal sheet fixed to the inner side of the respective half and formed with inwardly directed prongs to penetrate said hose radially inwardly from said outer surface thereof, the improvement comprising: all of said prongs being struck from said metal sheet to provide oblong openings through said sheet having circumferentially extending major axes and axially extending minor axes, all of said prongs being attached to said sheets along corresponding root lines extending in the direction of said major axes, whereby all of said prongs extend only circumferentially of said metal sheet, and said prongs having knife edges between the opposite ends of said root lines.

4,150,849

APPLICATOR

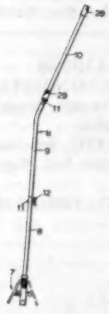
Colin Washbourne, Stourbridge, and Bryan W. Edwards, Sutton Coldfield, both of England, assignors to Foseco International Limited, England

Filed Aug. 24, 1977, Ser. No. 827,280

Claims priority, application United Kingdom, Aug. 17, 1976, 34101/76

Int. Cl.[2] B25J *1/00*

U.S. Cl. 294—19 R **10 Claims**



1. An applicator for holding a substantially flat object having a coating of adhesive on one face and applying the object to a substantially vertical surface, said applicator comprising a shaft having a handle at one end; a tray carried by the other end of said shaft, said tray having an open side facing away from said shaft and a lip along an edge of said open side away from said handle, said lip retaining said object on said tray; a pivotal joint mounting said tray on said shaft for angular movement about an axis transverse to said shaft and remote from said lip, said tray having a tilted position at one extreme of its angular movement and being so mounted with respect to said shaft that in said tilted position said open side faces partly towards said handle and said lip is prominent; the applicator further comprising spring means urging said tray towards said tilted position, the tray under pressure on said open side near said lip being angularly movable about said axis away from said tilted position against the action of said spring means.

4,150,850

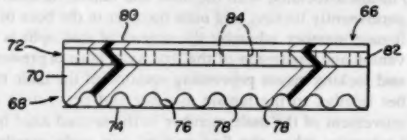
FOAM LAMINATES AND HEADLINERS

Ralph G. Doerfling, Southfield, Mich., assignor to Detroit Gasket and Manufacturing Company, Oak Park, Mich.

Division of Ser. No. 613,723, Sep. 15, 1975, Pat. No. 4,077,821. This application Sep. 29, 1977, Ser. No. 837,800

Int. Cl.[2] B60J *7/08*; B32B *3/28*

U.S. Cl. 296—137 A **3 Claims**



2. An automotive headliner having opposed side edges along its length supporting the concave mid-portion located between said side edges, the headliner having a greater length than width, comprising a corrugated paper substrate sheet having generally parallel projecting corrugations extending generally perpendicular to said headliner side edges providing rigidity between said side edges, a relatively flexible open cell thermosetting resin foam layer bonded to the corrugated face of said paper sheet with said corrugations projecting into and bonded to said foam layer and a flexible finish sheet overlying said foam layer, on the convex side of said headliner, said finish sheet comprising a relatively soft energy absorbing portion and a separate self-sustained, pervious layer wherein said relatively soft energy absorbing portion is spaced from said corrugations by said resin foam layer and by said self-sustained, pervious layer, said finish sheet forming a laminate with the foam layer located between and bonded to said sheet and said corrugations adding rigidity to said laminate and increasing the bonded area between the paper sheet and said foam layer, eliminating delamination.

4,150,851

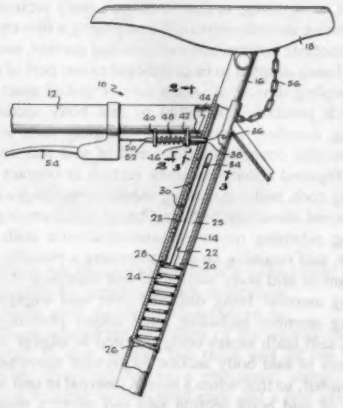
SEAT FOR BICYCLES AND THE LIKE

Henry Cienfuegos, 154 S. 8th. St., La Puente, Calif. 91746

Filed Sep. 7, 1977, Ser. No. 831,257

Int. Cl.[2] B62J *1/00*

U.S. Cl. 297—195 **7 Claims**



1. An apparatus of the class described comprising a frame, said frame comprising a generally vertically disposed frame seat post and an intersecting generally horizontally disposed frame bar, a seat post having opposed ends, one end of said seat post adapted to have a seat secured thereto, the opposite end of

said seat post split defining spaced parallel tines, the separation between said tines defining an aligning groove, said opposite end of said seat post movably positioned in said frame seat post, a first pin extending through the lower end of said frame seat post, a first coil spring in said frame seat post disposed between said first pin and said opposite end of said frame seat post, a second pin extending through the upper part of said frame seat post and passing through said aligning groove to align the seat on said frame, one of said tines having longitudinally spaced locking pin receiving holes formed therein, the upper part of said frame seat post having a locking pin hole formed therein, first and second bearing members mounted on said generally horizontally disposed frame bar, a generally horizontally disposed locking pin movably mounted on said first and second bearing members and in closely spaced relation to said horizontally disposed frame bar and sized to penetrate said hole in said frame seat post, a second coil spring mounted on said locking pin, a stop member rigidly mounted on said locking pin, said second coil spring disposed between said stop member and said first bearing member whereby said locking pin is biased toward said hole in said frame seat post, said second bearing member having elongated guide means formed thereon, said guide means cylindrical in shape and long in comparison to its thickness and in closely spaced relation to the intersection of said frame seat post and said horizontally disposed frame bar and covering said hole in said frame seat post, one end of said locking pin movably mounted in said guide portion of said second bearing member, and manually operable means extending closely adjacent the horizontal bar and connected to said locking pin for retracting said locking pin away from said hole in said frame seat post when the seat is to be adjusted.

4,150,852

METHOD OF STRIP MINING

Charles M. McCoy, P.O. Box 467, Prestonsburg, Ky. 41653

Filed May 18, 1977, Ser. No. 798,134
Int. Cl.[2] E21C *41/04*
U.S. Cl. 299—18 **11 Claims**

1. A method of strip mining comprising the steps of:

defining an elongate active mining area in a mining ground, said active mining area including a longitudinal axis, a leading end at one end of said longitudinal axis, a following end at the other end of said longitudinal axis, and a highwall intersecting said ends;

defining a plurality of benches in said active mining area, one of which forms a lowermost bench for supporting earth moving machinery and the other benches being located in said highwall to form a plurality of benches in said highwall above said lowermost bench;

positioning earth moving machinery on said lowermost bench;

continuously removing overburden from adjacent said leading end;

continuously transferring said removed overburden along said longitudinal axis on an overburden removal path which is located in said highwall benches, and which is spaced above said lowermost bench and which is located substantially parallel to said longitudinal axis to a rear location behind said following end, said overburden removal path being spaced apart and above said lowermost bench to be located so that the removed overburden moving in said overburden removal path and equipment used to move that removed overburden in that path does not interfere with the earth moving machinery located on said lowermost bench;

elevating that removed overburden which is located in said overburden removal path adjacent said active mining area following end from said overburden removal path in said highwall benches to a position adjacent the top of said highwall;

covering the mining area behind said following end by spilling said removed and elevated overburden over the highwall onto said lowermost bench;

depositing said spilled overburden into a spoil bank located immediately behind said following end;

shaping said spoil bank to match the contour of the mining ground adjacent said active mining area;

continuously removing coal from said active mining area while said overburden is being moved from adjacent said leading end to said rear end, said active mining area along with said overburden removal path being continously moved in the direction of said longitudinal axis across a mining ground by said continous overburden removing and transferring steps; and

continuously shaping said spoil bank whereby the contour of the land is continuously restored behind the moving active mining area as the active mining area moves across the mining ground.

4,150,853

METHOD OF STRIP MINING

Charles M. McCoy, P.O. Box 467, Prestonsburg, Ky. 41653

Continuation-in-part of Ser. No. 798,134, May 18, 1977. This application Mar. 2, 1978, Ser. No. 882,861
Int. Cl.[2] E21C *47/02*
U.S. Cl. 299—18 **9 Claims**

1. A method of strip mining comprising the steps of:

providing an elongate active mining area in a mining ground, said mining area having a longitudinal axis with leading and following ends located at opposite ends of said longitudinal axis, and a highwall intersecting said ends and spaced apart from said longitudinal axis, said highwall being essentially parallel with said longitudinal axis;

defining a main bench in said active mining area, said main bench intersecting said mining area ends and said highwall;

locating an overburden conveyor system on said main bench to be elevated above said main bench, said conveyor system being positioned high enough above said main bench so that machinery on said main bench can pass beneath said conveyor system, said conveyor system being essentially parallel with said mining area longitudinal axis;

continuously removing overburden from said mining ground adjacent said leading end;

continuously moving said removed overburden onto said elevated overburden conveyor system;

continuously moving said removed overburden along said elevated conveyor system toward said following end, said overburden conveyor system being located above said main bench, thereby keeping said removed overburden out of the way of machines located on said main bench;

elevating that removed overburden in said conveyor system which is located adjacent said active mining area following end from said conveyor;

moving said overburden off of said elevated conveyor system adjacent said following end, so that said active mining area is continuously moved across the mining ground;

covering the mining area behind said following end by spilling said removed overburden into a spoil bank located immediately behind said following end;

shaping said spoil bank to match the contour of the mining ground adjacent said active mining area;

continuously removing coal from said mining area while said overburden is moving on said conveyor system from adjacent said leading end to adjacent said following end;

moving said conveyor system along said mining area longitudinal axis;

said active mining area and said overburden removal conveyor system being moved in the direction of said mining area longitudinal axis across ground between the extents of a lease;

transporting said removed coal away from said mining area; and

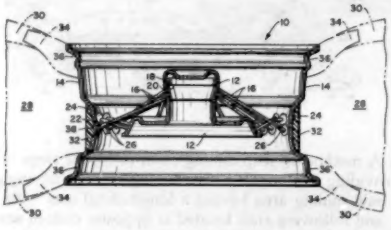
continuously shaping said spoil bank whereby the contour of the land is continuously restored behind the moving active mining area as the active mining area moves across the mining ground.

4,150,854

WIRE WHEEL SEALING SYSTEM

Kurt W. Lohmeyer, Fullerton, Calif., assignor to Tru-Spoke, Inc., Anaheim, Calif.

Filed May 9, 1977, Ser. No. 795,287
Int. Cl.[2] B60B *21/06, 21/12*
U.S. Cl. 301—58 **4 Claims**



1. A spoke wheel assembly comprising a pneumatic wheel including a plurality of spokes, a hub and a rim having a recessed annular drop-center portion, and generally rotatable retaining means joining the ends of the spokes to the hub and the drop-center portion of the rim, a continuous annular sealing member adherently received in said drop-center rim portion engaging the retaining means in generally non-rotatable securement formed of an in situ cured single system non-aqueous hot-melt thermoplastic composition comprising as essential components by weight about:

50 to 70%	polystyrene
25 to 32%	ester of phthalic acid and a 1 to 10 carbon alcohol
0 to 4%	calcium carbonate
0.5 to 5%	coumarone-indene resin;

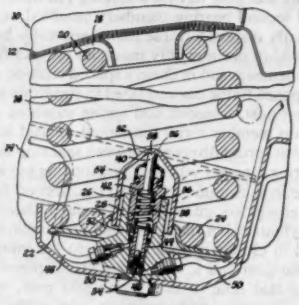
and having a melting point above about 140° F. and maintaining in use gas leakage prevention sealing adhesion to said rim and having a sufficient modulus to hold said spoke retaining means in generally non-rotatable position while being sufficiently resilient to absorb stress without delamination from the inner surface of the drop-center portion of the rim.

4,150,855

VEHICLE LOAD RESPONSIVE BRAKE ACTUATING PRESSURE PROPORTIONER AND ACTUATING LINKAGE THEREFOR

Michael Demido, Troy, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1977, Ser. No. 846,371
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—22 R **2 Claims**



1. A vehicle load responsive brake actuating pressure proportioner and actuating linkage therefor comprising:

a suspension arrangement for a vehicle including a suspension spring and a seat on which one end of said suspension spring is seated, said suspension spring being loaded in accordance with vehicle load;

said proportioner having a housing and a variable proportioning piston in said housing adapted to proportion brake actuating pressure therethrough, a proportioning spring loaded in compression to resist proportioning movement of said piston in accordance with vehicle load to modify the proportioning action of said piston accordingly, and a plunger engaging said proportioning spring and movable to load said proportioning spring in accordance with vehicle load;

and a lever mechanism acting operatively between said spring seat and said plunger to transmit only a proportional part of the vehicle load from said spring seat to said plunger;

said spring seat operatively engaging said plunger through said lever mechanism to load said plunger and therefore said proportioning spring and said proportioning piston in accordance with the load on said suspension spring to modify the proportioning action of said proportioning piston in accordance with changes in vehicle load as represented by the load on said suspension spring.

4,150,856

ONE-PIECE TRACK PIN

Peter Hakkenberg, Dunlap, and Richard E. Livesay, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 854,852
Int. Cl.[2] B62D *55/20*
U.S. Cl. 305—11 **7 Claims**

1. An articulated joint adapted for use in a track assembly for a track-type vehicle comprising

a one-piece pin means including a pair of laterally spaced cylindrical pin portions and a cylindrical bushing portion disposed intermediate said pin portions and having an outside diameter substantially larger than the outside diameters of said pin portions,

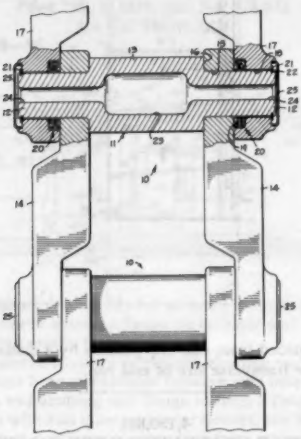
a pair of laterally spaced first links each secured to a respective pin portion of said pin means,

a pair of laterally spaced second links each pivotally mounted on a respective one of said pin portions,

retaining means for preventing axial outward movement of said second links relative to said pin means,

annular sealing means disposed between each adjacent pair of said first and second links and further disposed solely in an annular counterbore defined in each of said second links for engaging a respective one of said first links in sealing contact therewith,

means defining a lubricant-retaining cavity in said pin



means and passage means communicating said cavity with a pivotal connection between each of said second links and a respective one of said pin portions,

an end cap secured to an outer end of each of said second links for closing said passage means for preventing egress of lubricant thereby and ingress of dirt into said joint, and

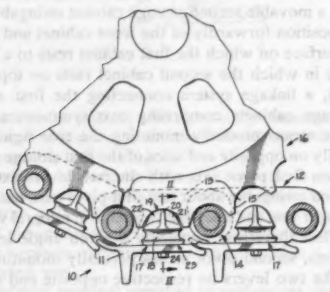
a retaining means positioned on each end of said pin means for preventing axial movement of said pin means relative to said second links and fully covered by said end cap to protect and prevent dislodgement of said retaining means.

4,150,857

ARMORED CUSHIONING LUG FOR TRACK-TYPE VEHICLES

Delbert D. Dester, Washington, and Paul L. Wright, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 16, 1978, Ser. No. 869,557
Int. Cl.[2] B62D *55/20*
U.S. Cl. 305—12 **17 Claims**



1. An endless track assembly for a track-type vehicle comprising

a drive sprocket comprising a plurality of circumferentially adjacent teeth,

a plurality of track shoes,

an articulated chain secured to said track shoes comprising a plurality of pivotally interconnected links,

pin and bushing means pivotally interconnecting adjacent links together and positioned to engage the teeth of said drive sprocket for driving said track assembly,

cushioning lug means secured to at least some of said track shoes, intermediate adjacent pairs of said pin and bushing means, for attenuating the noise level of said track assembly upon engagement with said drive sprocket, said lug means comprising

resilient spring means,

cap means mounted on said spring means and adapted to engage the teeth of said drive sprocket,

arcuately shaped bearing flange means secured on said cap means to extend transversely relative to pivot axes of said pin and bushing means and having a profile at least generally conforming to a respective root of said drive sprocket defined between each pair of circumferentially adjacent teeth thereof, and

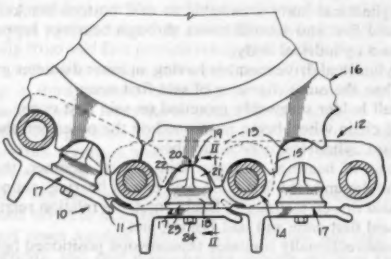
cleaning and reinforcing flange means secured on said cap means and disposed transversely relative to said bearing flange means for continuously cleaning the roots of said drive sprocket upon rotation thereof.

4,150,858

TENSIONED CUSHIONING LUG FOR TRACK-TYPE VEHICLES

Lawrence E. Fox, Peoria; Eugene R. Groff, Chillicothe, and Paul L. Wright, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 16, 1978, Ser. No. 869,561
Int. Cl.[2] B62D *55/20*
U.S. Cl. 305—57 **28 Claims**



1. An endless track assembly for a track-type vehicle comprising

a plurality of track shoes,

an articulated chain secured to said track shoes comprising a plurality of pivotally interconnected links,

pin and bushing means pivotally interconnecting adjacent links together and adapted to engage teeth of a drive sprocket for driving said track assembly, and

cushioning lug means secured to at least some of said track shoes, intermediate adjacent pairs of said pin and bushing means, for attenuating the noise level of said track assembly upon engagement with a drive sprocket, said lug means comprising

resilient spring means,

cap means mounted on said spring means and adapted to engage teeth of a drive sprocket, and

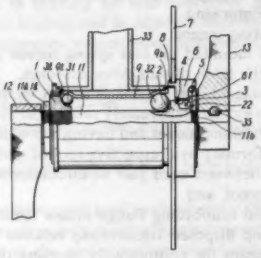
connecting means, comprising a non-rigid, flexible member exhibiting multi-directional flexibility at least substantially throughout the length thereof, attached in tension between a respective one of said track shoes and said cap means for preloading said spring means and for permitting multi-directional movement of said cap means relative to said one track shoe.

4,150,859

CHAIN WHEEL AND CRANK FOR A BICYCLE

Takashi Segawa, and Hitoshi Katayama, both of Sakai, Japan, assignors to Shimano Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 729,847, Oct. 5, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,803
Claims priority, application Japan, Oct. 17, 1975, 50-142048
Int. Cl.[2] F16C 3/04
U.S. Cl. 308—23.5 1 Claim



1. A chain wheel and a crank for a bicycle including a bottom bracket, said chain wheel and crank comprising:
- a rotatable crank shaft;
- a first crank arm separate from and fixed to one axial end of said crank shaft;
- a second crank arm separate from said first crank arm and said crank shaft and fixed to the other axial end of said crank shaft;
- a first cone integral with said crank shaft and disposed at said one axial end of said crank shaft;
- a second cone disposed about said other axial end of said crank shaft;
- a cylindrical body attachable to said bottom bracket with said first and second cones through bearings supporting said cylindrical body;
- a cylindrical drive member having an inner diameter greater than the outer diameter of said first cone;
- a ball holder screwably mounted on said first cone;
- said chain wheel being positioned on the outer periphery of said cylindrical driven member;
- a pair of bearings between said driven member, the ball holder and said first cone, said pair of bearings supporting said driven member in freely rotatable relation relative to said first cone and ball holder; and
- a unidirectionally rotatable transmission positioned between the pair of bearings for transmitting the rotation of said crank shaft from said first cone to said driven member in only one direction of rotation.

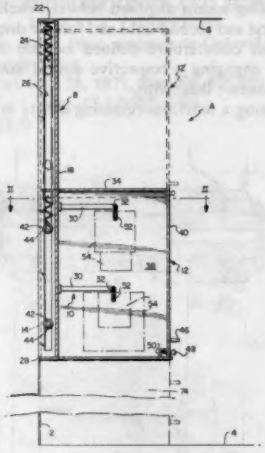
4,150,860

FILING SYSTEM FOR VERTICALLY SUPPORTING DOCUMENTS

Joseph C. V. Ducasse, 391 Donegal Pl., Martinez, Calif. 94553

Continuation-in-part of Ser. No. 722,219, Sep. 10, 1976, abandoned. This application May 17, 1977, Ser. No. 797,852
Int. Cl.[2] A47B 63/00; G09F 3/16
U.S. Cl. 312—184 5 Claims

1. A document filing cabinet system for vertically suspending documents in side-by-side relationship, said system comprising:
- a fixedly positioned vertically extending supporting frame;
- at least one arm fixedly attached to said frame and extending outwardly therefrom;
- a fixedly positioned rod supported substantially horizontally by said arm; and
- at least one document clip member in the form of a single integral device including a clip portion having a paper clip configuration for elastically gripping opposite sides of at least one document, and an open-sided hook integral with and extending from said clip portion, said clip portion and said hook being substantially entirely coplanar, said hook



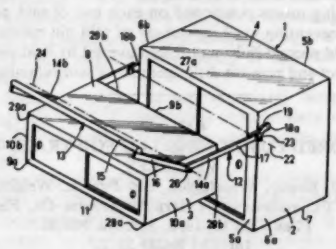
being spaced from said clip portion by a distance greater than the transverse size of said rod.

4,150,861

ARTICLE OF FURNITURE FOR CAMPERS

Michel Dufrancatel, 380 Allee Clair-Bois, 76230 Bois-Guillaume, France

Filed May 20, 1977, Ser. No. 798,837
Claims priority, application France, May 21, 1976, 76 15347
Int. Cl.[2] A47B 49/00
U.S. Cl. 312—266 2 Claims



1. An article of furniture for campers, a stationary first storage cabinet, a movable second storage cabinet swingable from a first rest position forwardly of the front cabinet and resting on a same surface on which the first cabinet rests to a second rest position in which the second cabinet rests on top of the first cabinet, a linkage system connecting the first and the second storage cabinets comprising two symmetrical, rigid levers, pivot means pivotally mounting the two rigid levers symmetrically on opposite end sides of the first storage cabinet on a common first pivot axis with the two levers extending forwardly and swingable about said first pivot axis, each lever having a longer arm and a second shorter arm integral with the first arm offset therefrom upwardly a given angle less than ninety degrees, second pivot means pivotally mounting symmetrically the two levers on respective opposite end sides of the second storage cabinet, each second pivot means pivotally mounting the two levers on a common second pivot axis at a juncture of each of the two arms thereof, said second pivot axis being disposed in a plane in which the center of gravity of said second storage cabinet is disposed, said first and second pivot axes being disposed in spaced parallel planes, and a rigid lift bar

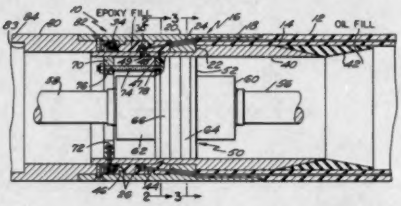
connecting the two offset arms of said levers above the level of the second storage cabinet, for lifting storage cabinet between the first and second rest positions thereof.

4,150,862

TERMINATION FOR A REINFORCED PLASTIC HOSE

Alan E. Markowitz, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1978, Ser. No. 874,973
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—15 13 Claims



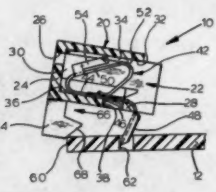
1. A termination assembly for an array comprising:
an outer sleeve having a flange on its inner wall with a cuff extending axially from said flange;
an inner sleeve having a protrusion abutting said flange;
a reinforced hose compressed between said inner and outer sleeves and abutting said flange to form a fluid tight connection with said inner and outer sleeves, said hose having reinforced components extending from at least one end; and
termination means surrounding said inner sleeve for terminating said reinforced components.

4,150,863

CIRCUIT BOARD CONNECTOR AND MEANS OF MOUNTING SAME

Kerry M. Krafthefer, Naperville, and John M. Stipanuk, Glen Ellyn, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 756,793, Jan. 5, 1977, abandoned. This application Dec. 21, 1977, Ser. No. 862,949
Int. Cl.[2] H01R *13/12*; H05K *1/18*
U.S. Cl. 339—17 LC 4 Claims



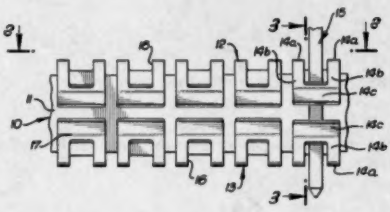
1. A connector assembly for electrically connecting an elongated pin conductor with a second circuit member, said connector assembly comprising:
an insulated housing including a terminal receiving recess formed therein, said recess having a top wall means, a bottom wall, a first end with an opening through which said pin conductor is received into the recess and a second end opposite the first end through which a terminal is inserted; and
an electrical terminal received in said recess, said terminal including means connectable with said second circuit member and a resilient loop-shaped portion for engaging the bottom of the pin conductor when inserted into the terminal receiving recess, said loop-shaped portion having a transverse dimension that is greater than the distance between the top wall means and bottom wall so that the loop-shaped portion is partially flattened by the top wall means upon insertion into the recess, and is flattened more when said pin conductor is subsequently inserted into the recess, said terminal further including receptacle means formed on said loop-shaped portion for laterally engaging said pin conductor when inserted into the recess.

4,150,864

DOUBLE CONTACT BUS STRIP

Leo Walter, Palos Verdes Peninsula, Calif., assignor to Electronic Stamping Corporation, Compton, Calif.

Filed Feb. 6, 1978, Ser. No. 875,160
Int. Cl.[2] H01R *31/08*
U.S. Cl. 339—19 4 Claims



1. In a double contact electrical bus strip to receive a terminal post, the combination comprising
(a) a horizontally elongated bus strip, and
(b) two contacts in the form of hook-shaped tangs which are vertically spaced apart and which are integral with the bus strip,
(c) each of said tangs including a section having a first laterally extending portion, and a nose, the section including a second portion extending generally vertically and diagonally from said first portion relatively toward the nose and toward the bus strip, at one side thereof, the section having a third portion extending generally vertically and laterally away from the nose and the bus strip,
(d) said first portions defining vertically spaced openings to pass the terminal post in vertically assembled relation between both tangs and the bus strip,
(e) said first and second portions being continuously bifurcated between said bus strip and said nose,
(f) said noses located vertically intermediate said tang first portions, and said noses having convex surfaces facing said bus strip,
(g) the bus strip having a side facing said noses, said side extending vertically straight between said bifurcations.

4,150,865

MAGNETO TO SPARK PLUG AIRCRAFT WIRING HARNESS

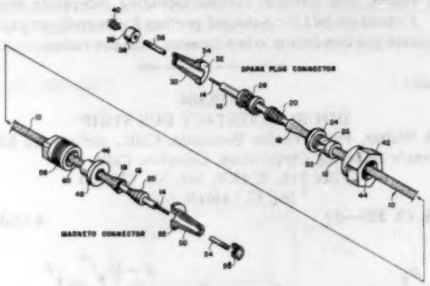
Charles E. Iliff, Hgr. 17, Intl. Airport, Tulsa, Okla. 74115

Filed Jul. 18, 1977, Ser. No. 816,370
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—26 7 Claims

1. A lead conductor for a spark plug having a threaded cylindrical barrel encasing the plug insulator and contact, the connector comprising;
(a) a shielded insulated conductor;
(b) inner and outer complementary tapered ferrules mounted near one end of said conductor, the reduced size end being oriented toward the conductor and away from the plug for gripping the end portion of the shielded material between said inner and outer ferrules;
(c) a threaded terminal fastened to the conductor end;
(d) a contact nut affixed to said threaded terminal;

(e) a contact spring threaded to the end of the threaded terminal;

(f) a tubular grommet of flexible insulative material having a passageway therethrough interposed on said conductor



between the contact nut and the ferrules, the end of the grommet in contact with said ferrules having a flared shoulder; and

(g) a cap means for securing the outer ferrule to the cylindrical barrel.

4,150,866

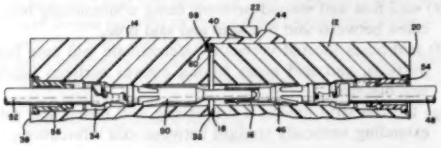
ENVIRONMENTALLY SEALED CONNECTOR

Clair W. Snyder, Jr., Hellam; Paul B. Derr, Middletown, and Thomas H. Wycheck, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 26, 1977, Ser. No. 827,910

Int. Cl.[2] H01B *17/30, 19/00;* H01R *7/02;* H02G *15/04*

U.S. Cl. 339—94 M **17 Claims**



1. An environmentally sealed connector assembly comprising:

first and second mating members each having a body of semi-rigid insulating material with a mating front face and a rear face and at least one contact receiving cavity extending therein between said faces, a rear end of each said contact receiving cavity being recessed within the respective rear face;

a like number of first and second mating contacts each terminating respectively a first and second lead and each positioned within respective cavities of said first and said second mating members; and

a plurality of sealing boots each mounted in a rear portion of a respective cavity in sealing engagement with the bore walls of a respective contact receiving cavity and with a respective lead passing therethrough, each said sealing boot lying totally beneath said rear face in a fully inserted sealing position.

4,150,867

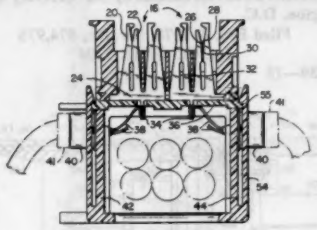
PRE-WIRED TERMINAL CONNECTING BLOCK

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Continuation-in-part of Ser. No. 507,972, Sep. 20, 1974, abandoned. This application Oct. 26, 1977, Ser. No. 845,602

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—97 P **46 Claims**



1. A mounting bracket for terminal blocks the mounting bracket including:

an elongated rear portion having end panels and divider means between the end panels to define a plurality of openings in the rear portion to receive unitary connectors;

first and second spaced apart elongated side portions extending from said rear portion and being generally perpendicular thereto;

each of said side portions having a plurality of recesses to receive unitary connectors;

said side portions terminating at an open front portion of the bracket and defining mounting surfaces for receiving a terminal block; and

mounting means for mounting the bracket on a support; and

flexible clamps adjacent each end of each side portion for releaseably retaining a terminal block on the bracket.

4,150,868

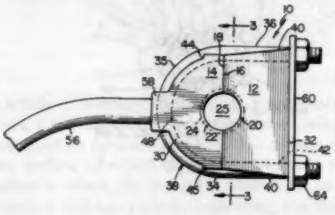
BATTERY CONNECTOR CLAMP

George H. Urban, 1430 N. Dakota Ave., Sioux Falls, S. Dak. 57102

Filed Dec. 14, 1977, Ser. No. 860,551

Int. Cl.[2] H01R *11/26*

U.S. Cl. 339—233 **3 Claims**



1. A battery connector clamp comprising a pair of solid jaws formed from hard metal and adapted to be positioned on opposite sides of a battery post, said jaws being of the same thickness which is substantially equal to the height of the post and said jaws having inner abutting ends formed with cooperating opening means to receive the battery post and having outer free ends, the outer end of one jaw being substantially semi-circular and being formed therethrough with a bore for fixedly receiving an end of a cable which is adapted to communicate with the opening means to engage the battery post and the outer end of the other jaw being substantially flat, a U-bolt having an arcuate bight portion and substantially parallel shanks, said outer end of the one jaw having a groove for

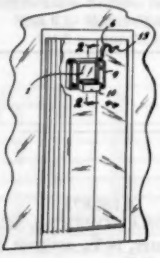
seating the bight portion of the bolt, said other jaw having opposing sides formed with grooves for the reception of the shanks of the bolt, said groove in the outer end of the one jaw being arcuate and having its ends in the opposing sides of the jaw and disposed in axial alignment with the grooves in the other jaw with the grooves in the other jaw increasing in depth from the inner end of the said jaw to the outer end thereof and being of a depth adjacent the outer end at least equal to the diameters of the bolt shanks seated therein, said shanks having outer free end portions extending beyond the outer end of the other jaw when the jaws are abuttingly clamped on the battery post, securing members adjustably disposed on the end portions of the shanks and a clamping member movably carried by the shank end portions and against which the securing members bear to tighten the clamping member against the outer end of the other jaw with the clamping member being in clamping cooperation with the bight portion of the bolt so as to clamp the jaws tightly onto the post, and means carried by the outer end of the one jaw and extending therefrom over the cable end to cooperate with the bight portion of the bolt in protecting the cable end as it protrudes from the bore.

4,150,869

CONDENSATE-PROOF MIRROR

Robert B. Hansen, 6902 Shannon Dr., Huntington Beach, Calif. 92647

Filed Nov. 3, 1977, Ser. No. 848,293
Int. Cl.[2] G02B *7/18*
U.S. Cl. 350—61 **1 Claim**



1. In a condensate-proof mirror for use in a shower or steam bath environment and including means for contacting a rear-reflective surface of the mirror with a stream of downwardly flowing shower or steam bath-derived hot fluid for heating of a front reflective mirror surface of the condensate-proof mirror to a temperature higher than that of ambient moisture laden air of the shower or steam bath, the improvement comprising:

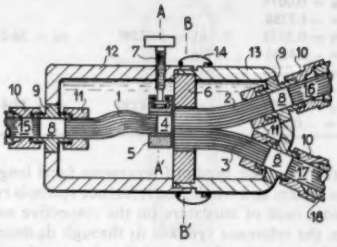
housing means including utility storage means and a removable open-top catch basin for collecting downwardly flowing hot liquid discharging from a lower end of the rear surface of the mirror, a substantial portion of the open top of said catch basin extending forwardly of the forward surface of the reflective mirror surface wherein hot liquid in said catch basin is readily accessable to a user for purposes attendant showering or steam bathing, and a deflector lip integral with the rear surface of the mirror adjacent the lower end of the rear surface of the mirror for deflecting hot liquid rearwardly into the catch basin.

4,150,870

ADJUSTABLE DISTRIBUTOR DEVICE FOR SHARED TRANSMISSION OF RADIANT ENERGY

Luigi d'Auria, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 19, 1977, Ser. No. 817,011
Claims priority, application France, Jul. 23, 1976, 76 22621
Int. Cl.[2] G02B *5/16*
U.S. Cl. 350—96.16 **8 Claims**



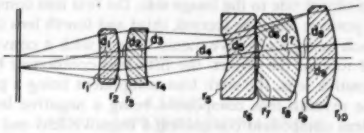
1. An adjustable distributor device providing shared transmission of radiant energy between an optical feeder cable and at least two optical receptor cables, said distributor device comprising an input connector, N output connectors, and optical coupling means providing a shared transmission of radiant energy from said input connector to said N output connectors; said optical coupling means comprising a fixed radiation conductor element of forked design, having N legs respectively connected to said N output connectors and ending in a flat entry face, a mixer element made of a single optical fiber having an exit face communicating with said flat entry face, and an optical cable linking said input connector to the entry face of said mixer element; said distributor further comprising mechanical means displacing said mixer element, for adjusting the distribution of said radiant energy between said legs.

4,150,871

MICROSCOPE OBJECTIVE LENS SYSTEM

Tsutomu Tojyo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,937
Claims priority, application Japan, Apr. 13, 1976, 51/41674
Int. Cl.[2] G02B *21/02, 11/30*
U.S. Cl. 350—175 ML **4 Claims**



1. An objective lens system for microscopes comprising a first positive lens, a second positive meniscus lens, a third negative lens, a fourth positive meniscus lens and a fifth positive meniscus lens, and said lens system having the following numerical data:

f = 1 WD = 0.3980	NA = 0.25	β = −9.977 Petzval sum 0.20
r_1 = −1.6154 d_1 = 0.0940	n_1 = 1.72916	ν_1 = 54.7
r_2 = −0.4890 d_2 = 0.0281		
r_3 = 0.3617		

-continued

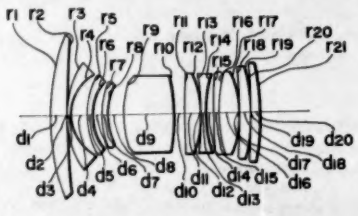
f = 1 WD = 0.3980	NA = 0.25	β = −9.977 Petzval sum 0.20
d_3 = 0.1055	n_2 = 1.64	ν_2 = 60.2
r_4 = 1.0714		
d_4 = 0.4012		
r_5 = −0.1965		
d_5 = 0.1307	n_3 = 1.80518	ν_3 = 25.4
r_6 = ∞		
d_6 = 0.0075		
r_7 = −1.3286		
d_7 = 0.2132	n_4 = 1.62299	ν_4 = 58.2
r_8 = −0.4663		
d_8 = 0.0344		
r_9 = −12.9551		
d_9 = 0.1399	n_5 = 1.64250	ν_5 = 58.4
r_{10} = −0.6018		

wherein the reference symbol f represents focal length of the entire lens system as a whole, the reference symbols r_1 through r_{10} designate radii of curvature on the respective surfaces of the lenses, the reference symbols d_1 through d_9 denote thicknesses of the respective lenses and the airspace therebetween, the reference symbols n_1 through n_5 represent refractive indices of the respective lenses and the reference symbols ν_1 through ν_5 designate Abbe's numbers of the respective lenses.

4,150,872
MINIATURE AND LARGE APERTURE WIDE-ANGLE PHOTOGRAPHING LENS

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1977, Ser. No. 831,317
Claims priority, application Japan, Sep. 9, 1976, 51-108225
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—214 **3 Claims**



1. A miniature and large aperture wide-angle lens composed of eleven lenses grouped in nine lens components, in order from the object side to the image side, the first lens component being a positive lens, the second, third and fourth lens components each being a negative meniscus lens with it convex side directed toward the object, the fifth lens component being a thick positive lens, the sixth lens component being a positive lens, the seventh lens component being a negative lens, the eighth lens component comprising a negative lens and a positive lens cemented together to form a positive lens, and the ninth lens component comprising two positive lenses, wherein the radii of curvature r_1 to r_{21}, the spacings or thicknesses d_1 to d_{20}, the indicies of refraction n_1 to n_{11} and Abbé numbers ν_1 to ν_{11} of the first through the eleventh lenses L_1 to L_{11} are as follows:

F = 100, Aperture ratio = 1:2.0, field angle = ±47°

lens	radius of curvature	spacing and thickness	refractive index	Abbé No.
L_1	r_1 = 290.17			
		d_1 = 19.90	n_1 = 1.61800	ν_1 = 63.4
	r_2 = 891.67			
		d_2 = 0.49		

-continued

F = 100, Aperture ratio = 1:2.0, field angle = ±47°

lens	radius of curvature	spacing and thickness	refractive index	Abbé No.
L_2	r_3 = 119.80			
		d_3 = 5.83	n_2 = 1.74100	ν_2 = 52.7
	r_4 = 56.08			
		d_4 = 19.47		
L_3	r_5 = 110.59			
		d_5 = 5.87	n_3 = 1.64000	ν_3 = 60.2
	r_6 = 61.82			
		d_6 = 12.23		
L_4	r_7 = 126.08			
		d_7 = 5.83	n_4 = 1.64000	ν_4 = 60.2
	r_8 = 82.04			
		d_8 = 19.85		
L_5	r_9 = 175.98			
		d_9 = 59.81	n_5 = 1.80518	ν_5 = 25.4
	r_{10} = −304.60			
		d_{10} = 15.05		
L_6	r_{11} = 1019.49			
		d_{11} = 18.88	n_6 = 1.67000	ν_6 = 57.4
	r_{12} = −127.51			
		d_{12} = 0.49		
L_7	r_{13} = −305.85			
		d_{13} = 6.60	n_7 = 1.80518	ν_7 = 25.4
	r_{14} = 160.93			
		d_{14} = 9.37		
L_8	r_{15} = 1239.99			
		d_{15} = 5.87	n_8 = 1.84666	ν_8 = 23.9
L_9	r_{16} = 187.79			
		d_{16} = 24.47	n_9 = 1.58313	ν_9 = 59.4
	r_{17} = −113.12			
		d_{17} = 0.49		
L_{10}	r_{18} = −642.38			
		d_{18} = 12.19	n_{10} = 1.71300	ν_{10} = 53.9
	r_{19} = −223.24			
		d_{19} = 0.49		
L_{11}	r_{20} = −1011.00			
		d_{20} = 10.83	n_{11} = 1.80610	ν_{11} = 40.9
	r_{21} = −324.47			

Backfocus = 178.71 = 1.787F
$F_{1.2.3.4.5}$ = −468.42 = −F/0.213
$f_{16(n8-n9)}$ = 49.49 = 0.495F
Petzval's sum = 0.101

4,150,873
BI-DIRECTIONAL OPTICAL SCANNING

George J. Dali, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,487
Int. Cl.[2] H04N *1/10*
U.S. Cl. 358—285 **2 Claims**

1. Copy apparatus having means for receiving a document to be copied; said apparatus comprising:

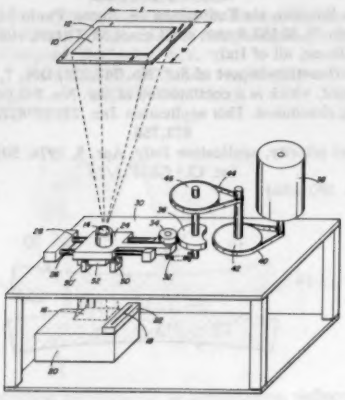
linear photoreceptor array means for repeatedly generating a series of electrical signals which are representative of discrete areas of a line of radiant energy incident thereon;

means for scanning successive lines of a light image of a received document across said array means in a first direction, from one edge of a received document toward the other edge and then, during the next successive copy cycle, in a second direction from said other edge toward said one edge;

buffer memory means, associated with said array means, for receiving the electrical signals in the line order generated; and

means for (1) withdrawing from said buffer memory means in the line order received, the electrical signals generated

during said first direction scans, and (2) withdrawing from said buffer memory in a line order opposite to that received, the electrical signals generated during said second direction scans.

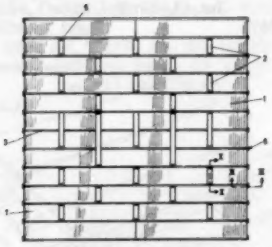


4,150,874

MIRROR MOUNTING

Jerome Grassin, Vanves; Maurice Thouvenin, Parmain, and Jean-Claude Épié, Montmorency, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 11, 1977, Ser. No. 776,613
Claims priority, application France, Mar. 17, 1976, 76 07756
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—292 **6 Claims**



1. A mirror comprising a plurality of reflecting components mounted on a frame

said frame comprising an array of spaced-apart substantially parallel support members, said members being curved to conform generally to the contour of a continuously curved mirror,

said reflecting components comprising plane rectangular reflecting strips,

the longer sides of said reflecting strips being attached between pairs of the support members and being deformed by attachment means to conform in the direction of their longer dimension to the curvature of the support members, and

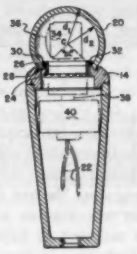
the shorter sides of said reflecting strips being substantially flat.

4,150,875

PRESSURE-RESISTANT HOUSING

Jerry D. Stachiw, Lakeside, and George M. Horn, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 23, 1977, Ser. No. 836,255
Int. Cl.[2] G02B *5/00*
U.S. Cl. 350—319 **16 Claims**



1. A housing which is transmissive to radiation of selected frequencies comprising:

a hyperhemispherical window which is provided with a seating surface, said seating surface being frustoconical;

mounting means for providing forces to support said window and to resist extreme external pressure applied to said window, said mounting means having a frustoconical bearing surface in abutting relationship with said frustoconical seating surface of said window, said frustoconical bearing surface for transmitting all of said supporting and pressure resisting forces from said mounting means to said frustoconical seating surface of said window;

compressible means adjacent to said window and to said mounting means for sealing said window against external pressure and

holding means contained within said hyperhemispherical window for compressing said compressible means to seal said window, and for retaining said frustoconical seating surface of said window in immovable abutting relationship with said frustoconical bearing surface of said mounting means.

4,150,876

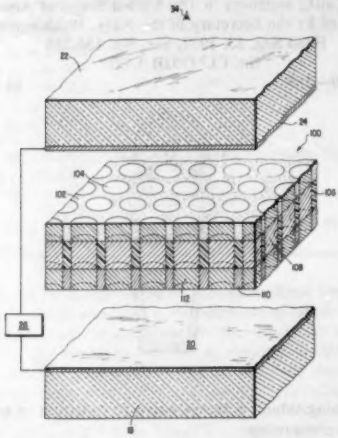
LIGHT AMPLIFICATION DEVICE

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 812,811, Jul. 5, 1977, , which is a continuation of Ser. No. 680,488, Apr. 26, 1976, abandoned. This application Jun. 2, 1978, Ser. No. 911,821
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—338 **34 Claims**

1. A light amplifier display employing ambient light of the type including a pair of transparent sheet conductors, one each at the input and the output sides of the amplifier, means establishing an electrical field between them, a photoconductive medium and an electro-optic medium both being sandwiched by the transparent sheet conductors, the improvement comprising, means within said amplifier display for defining a gravure lattice array of points as viewed by the receiver of the

display of said electro-optic medium, so that an image defined by the electro-optic medium will consist of gravure points



instead of being continuous over its surface, said means positioned between said transparent conductors.

4,150,877

LIQUID CRYSTAL DISPLAY DEVICE

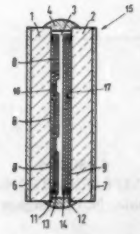
Manfred Kobale, Faistenhaar; Hans Krieger, Munich, and Hans-Peter Lorenz, Feldkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1976, Ser. No. 717,709

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1975, 2539951; Sep. 2, 1975, 2539024; Sep. 2, 1975, 2539012

Int. Cl.² G02F *1/13*

U.S. Cl. 350—341 **2 Claims**



1. In a liquid crystal display device having a pair of carrier plates each having a first surface, said plates being hermetically sealed together with the first surfaces facing each other and extending plane parallel to each other to form a chamber each of said first surfaces having an electrically conducting electrode layer and an aligning layer of an obliquely vapor deposited material, and a layer of liquid crystal material disposed in said chamber, the improvement comprising a covering layer disposed on each of said aligning layers, each of the covering layers being a silane derivative which is bound to the aligning layer by chemosorption.

4,150,878

HOLLOW-SPACE CELL AND METHOD FOR ITS MANUFACTURE

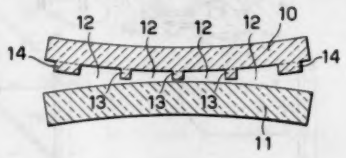
Giorgio Barzilai, via Eudossiana 18, Rome; Paolo Maltese, via Donolo 29, 00153 Rome, and Cesare M. Ottavi, viole Soroalio 214, Rome, all of Italy

Continuation-in-part of Ser. No. 748,376, Dec. 7, 1976, abandoned, which is a continuation of Ser. No. 565,049, Apr. 4, 1975, abandoned. This application Jan. 23, 1978, Ser. No. 871,756

Claims priority, application Italy, Apr. 5, 1974, 50199 A/74

Int. Cl.² G02F *1/13*

U.S. Cl. 350—344 **15 Claims**



1. A hollow-space cell of the kind comprising at least one couple of planar supporting members welded to one another alongside the edges, between which there is formed a hollow space, for lodging a liquid crystal, and a plurality of spreaders, having same thickness as that of the hollow space, with a preselected distribution between the confronting surfaces of the two supporting members, characterized in that the supporting members have starting surfaces which are not mating before the assembling and in absence of internal stresses and are, in the final cell, in a state of elastic deformation such as to impart to the surfaces of the supporting members a parallel condition in which they are in contact with each other via the spreaders and the peripheral frame of the hollow space.

4,150,879

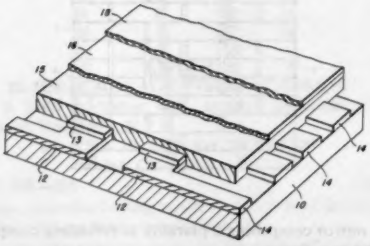
SOLID DRY ELECTROCHROMIC DISPLAY

Michel L. Bayard, 6614 Lake Circle Dr., Dallas, Tex. 75261, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1976, Ser. No. 741,320

Int. Cl.² G02F *1/00*

U.S. Cl. 350—357 **6 Claims**



1. An electrochromic display cell comprising:

a transparent front panel member of sufficient thickness to act as the structural support substrate of said cell,

a plurality of display electrodes supported on and visible through said front panel and comprised of an oxide of tungsten or vanadium,

a counter-electrode comprised of a sodium tungstate or vanadate;

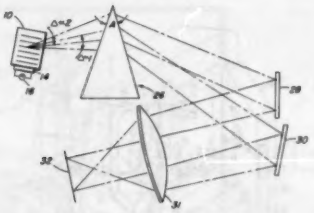
a dry solid electrolyte interposed between and contacting said display electrodes and said counter-electrode, said electrolyte being electrically insulating but conductive of sodium ions; and

electrical contact means to each of said electrodes.

4,150,880
OPTICAL ACHROMATIZATION FOR ACOUSTOOPTIC DEFLECTORS

Dennis G. Howe, Fairport; Richard N. Blazey, Rochester, and James C. Owens, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,205
Int. Cl.[2] G02F 1/33
U.S. Cl. 350—358 9 Claims



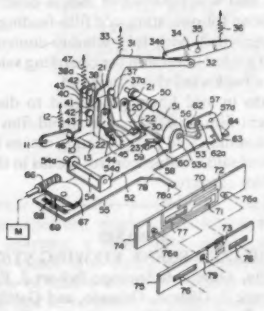
1. In apparatus including (1) an acoustooptic deflector cell, (2) variable frequency means for generating acoustic waves in said cell, and (3) means for impinging light of a plurality of different selected optical wavelengths upon said cell whereby said light of each selected optical wavelength will be diffracted through a scan angle proportional to its wavelength as the frequency of said generator means is varied; the improvement comprising:

a prism in the path of the diffracted light for magnifying the scan angle of light of each optical wavelength, said prism having an apex angle (1) equal to or greater than that minimum apex angle at which the absolute magnitude of scan angle magnification of said scan angles increases as the optical wavelength of light decreases and (2) less than that maximum angle at which light of the longest of said selected optical wavelengths is totally internally reflected in said prism.

4,150,881
FILM FEEDING DEVICE FOR SOUND MOTION PICTURE CAMERA

Takashi Tobioka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jul. 5, 1978, Ser. No. 921,975
Claims priority, application Japan, Jul. 11, 1977, 52-82729
Int. Cl.[2] G03B 31/02
U.S. Cl. 352—27 5 Claims



1. A film feeding device for a sound motion picture camera for continuously advancing film past a sound recording head comprising

a capstan which rotates at a constant speed,

a pinch roller cooperating with the capstan to advance the film and movable between an operative position in which the pinch roller is pressed against the capstan to pinch the film between the pinch roller and the capstan and a retracted position in which the pinch roller is spaced from the capstan,

a movable support member for rotatably supporting the pinch roller, said support member being movable between a first position in which the movable support member holds the pinch roller in the retracted position and a second position in which the movable support member holds the pinch roller in the operative position,

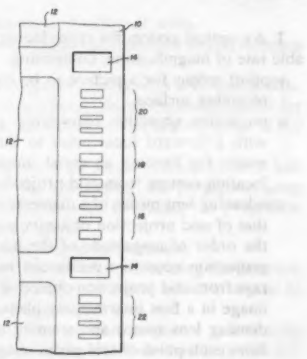
a reciprocating member which is driven back and forth between an initial position and an extreme position by means of an electric motor, said movable support member being moved to the second position when the reciprocating member is driven toward the extreme position and returned to the first position when the reciprocating member is reversed to the initial position, and

a motor control circuit means including a trigger switch which is turned on and off associated with a shutter release button of the camera, the motor control circuit means being arranged to energize the motor when the trigger switch is turned on keep the motor energized until said reciprocating member reaches the extreme position, deenergize the motor when the reciprocating member is in the extreme position and energize the motor again when the trigger switch is opened.

4,150,882
IDENTIFICATION CODE GENERATOR FOR HIGH SPEED MOTION PICTURE PHOTOGRAPHY

William L. Konick, 1111 University Blvd. W., Silver Spring, Md. 20902, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1976, Ser. No. 736,979
Int. Cl.[2] G03B 17/24
U.S. Cl. 352—39 10 Claims



1. In the combination of a movie camera having a light source for recording information by a single light beam on a film edge and a code generator for driving said light source, the improvement being in said code generator which comprises:

input means for producing a serial binary code signal of N bits, where N is greater than six;

a pulse width means for generating a variable pulse width representing a logic zero or a logic one in response to said code signal;

output means for driving said light source; and

control means connected to said input and pulse width means for causing the signal to be transferred from said input means to said output means through said pulse width means at a rate sufficiently greater than the speed of said film to record all N bits on the edge of a sngle frame of said film in a serial sequence.

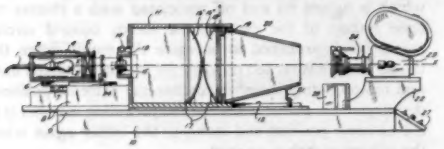
4,150,883
CINECONVERSION MACHINE

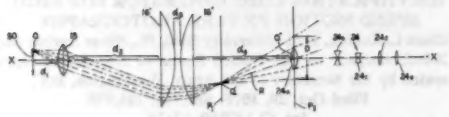
Thomas J. Whatley, Washington, D.C., and William M. Drennen, Jr., Great Falls, Va., assignors to Comcorps Communication Corps Inc., Washington, D.C.

Continuation-in-part of Ser. No. 613,798, Sep. 16, 1975, Pat. No. 4,035,067, which is a continuation-in-part of Ser. No. 543,952, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 297,241, Oct. 13, 1972, Pat. No. 3,867,022, which is a continuation-in-part of Ser. No. 92,315, Nov. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 866,240, Oct. 14, 1969, abandoned. This application Jul. 11, 1977, Ser. No. 814,771

Int. Cl.[2] G03B *21/32*

U.S. Cl. 352—87 6 Claims





1. An optical system for reproducing a picture with a variable rate of magnification, comprising:

support means for a picture to be reproduced on a distant receiving surface;

a projection objective rearwardly of said support means with a forward focal point to the rear of said support means for forming an aerial image of said picture at a location remote from said projection objective;

condensing lens means of a diameter substantially exceeding that of said projection objective and of a focal length on the order of magnitude of the back-focal length of said projection objective positioned to intercept converging rays from said projection objective for locating said aerial image in a first intermediate plane proximal to said condensing lens means and training a diverging light cone from each point of said aerial image upon an optical axis common to said projection objective and said condensing lens means, each light cone having a centerline intersecting said axis in a common point conjugate to the rear nodal point of said projection objective;

holding means for supporting an interposed object at said first intermediate plane; and

a varifocal objective centered on said axis rearwardly of said condensing lens means for projecting said aerial image along with an image of said interposed object with variable magnification rate upon a receiving surface to the rear thereof, said varifocal objective having a stationary front component including a forward lens member substantially located in a second intermediate plane passing through said common point in which the diameter of each light cone from said aerial image at least equals the diameter of said forward lens member whereby the natural entrance pupil of said varifocal objective is overfilled in substantially the entire varifocal range thereof.

4,150,884
MOTION-PICTURE CAMERA

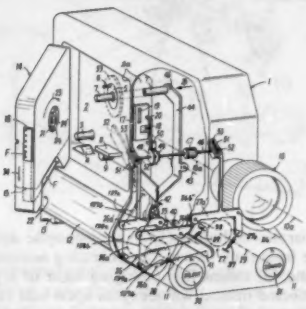
Willi Reichen, Yvonand, Switzerland, assignor to Bolex International SA, Ste.-Croix, Switzerland

Filed Apr. 27, 1977, Ser. No. 791,208

Claims priority, application Switzerland, Apr. 30, 1976, 005445/76

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C 11 Claims



1. In a motion-picture camera provided with a housing accommodating silent-film cassettes and sound-film cassettes, each cassette being provided with a takeup reel having an externally accessible hub and rewind-stop means for preventing reverse rotation of said takeup reel, the combination therewith of:

reversible film-feeding means in said housing including a reciprocable traction claw engageable with an accessible film portion on either type of cassette moving past an image gate of said housing, said film-feeding means further including catch means engageable with the hub of an inserted cassette for entraining the takeup reel thereof;

release means in said housing engageable with the hub of a sound-film cassette for deactivating said rewind-stop means thereof;

normally inactive windup-control means for at least reducing the operating speed of said catch means during reciprocation of said traction claw to permit the accumulation of a reserve stretch of film within a silent-film cassette downstream of said image gate;

programming means selectively settable into a first condition for operating said film-feeding means in a forward direction with said windup-control means deactivated, a second condition for operating said film-feeding means in said forward direction with said windup-control means activated, and a third condition for operating said film-feeding means in a backward direction; and

sensing means in said housing adapted to discriminate between silent-film cassettes and sound-film cassettes for partially disabling said programming means to prevent the activation of said windup-control means in the presence of a sound-film cassette.

4,150,885
STABILIZED SCENE VIEWING SYSTEM

Denis R. Breglia, Altamonte Springs; Robert J. Entwistle, Winter Park; Frank J. Oharek, Orlando, and Gottfried R. Rosendahl, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 817,953

Int. Cl.[2] G03C *11/00*

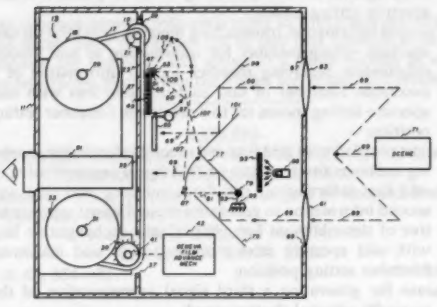
U.S. Cl. 352—130 20 Claims

1. A stabilized image viewing system, comprising in combination:

means for viewing an object by an observer that is spatially disposed from said object;

means for timely photographing a succession of separate and distinct images of the aforesaid object on a predetermined film adapted for being processed immediately prior to the exposure of said film to the separate and distinct images of said object;

means effectively connected to said photographing means for processing the film thereof in such manner prior to the



exposure thereof to said object as to timely effect a positive image of said object on said film after exposure of said film to said object which may be viewed by said observer almost immediately thereafter; and

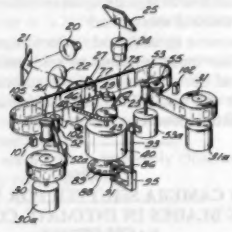
means connected between said object viewing means and the aforesaid photographing and film processing means for selectively enabling one or the other in such manner that said observer may either view said object or the aforesaid filmed image thereof in response to predetermined trigger signals, respectively.

4,150,886

MOTION PICTURE PROJECTOR SYSTEM

Stephen L. Merkel, Bay Village; Charles B. Small, Elyria, both of Ohio, and Barton F. Norton, Columbia, Md., assignors to Airborne Mfg. Co., Elyria, Ohio

Filed Aug. 26, 1976, Ser. No. 717,879
Int. Cl.[2] G03B *1/00*
U.S. Cl. 352—166 **26 Claims**



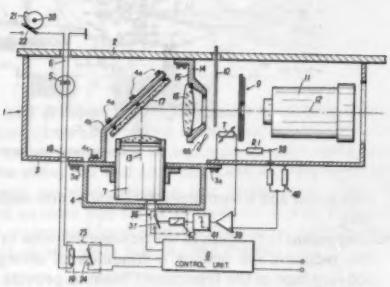
1. A projector for motion picture film comprising means defining a frame aperture, means for projecting a beam of light through said aperture, a shutter for interrupting said light beam, a servo motor and means for connecting said servo motor to a strip of film, a circuit associated with said shutter for controlling said servo motor to cause it to position a frame of said film strip in said aperture during said interruption of said light beam, a capstan and a pinch roller on each side of said frame aperture, means for determining the amount of film between each of said capstans and said frame aperture, circuit means operatively connected to said amount of film determining means for controlling said capstans to maintain a film loop substantially constant size between each of said capstans an said frame aperture, a motor driven reel adjacent each of said capstans for storing film, and circuit means responsive to said capstan control circuit means for controlling each of said reels to take film from and supply film to corresponding ones of said capstans while maintaining substantially constant tension on said film.

4,150,887

SWITCHING DEVICE FOR PROJECTION LAMP

Franz Huber, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 14, 1977, Ser. No. 851,496
Claims priority, application Austria, Nov. 30, 1976, 8870/76
Int. Cl.[2] G03B *21/20*
U.S. Cl. 353—85 **9 Claims**



1. In a projector adapted for use with a projection lamp, the latter being controlled from outside of the projector casing by a separated electrical control unit located outside of the projector casing and electrically connected to the projection lamp, the control unit supplying electrical energy to the projection lamp,

a projector casing having a plurality of walls,

optical means disposed within said projector casing defining an optical axis,

means for aligning a projection lamp with said optical axis,

manually operable mode selector means on the projector for controlling at least one mechanical operation mode of the projector,

connecting means for the separated electrical control unit outside said casing for controlling the projection lamp from outside the casing and for providing the projection lamp with electric energy,

the improvement comprising in combination:

said connecting means additionally performing the function of operatively connecting said mode selector means to said separated electrical control unit, and

said mode selector means on the projector constituting means for controlling said separated electrical control unit for controlling the projection lamp from the projector via said connecting means.

4,150,888

CLOSED LOOP AUTOMATIC FOCUSING UNIT

Danny Filipovich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 632,737, Nov. 17, 1975, abandoned. This application Jul. 29, 1977, Ser. No. 820,483
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—25 **5 Claims**

1. A closed loop automatic focusing system comprising:

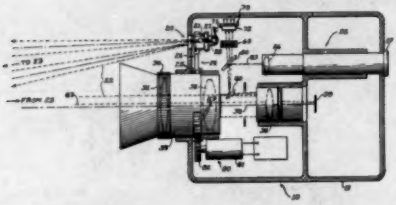
means for producing a beam of non-visible radiation directed towards and reflected from an object;

afocal objective lens means for refracting the beam of non-visible radiation reflected from the object and visible light radiation reflected from the object, the lens means having the characteristic of refracting the reflected beams of

non-visible radiation and the reflected visible light radiation in divergent or convergent form when the object is not in focus and refracting the reflected beam of non-visible radiation and reflected visible light radiation in collimated form when the object is in focus;

means for sampling the beam of non-visible radiation and visible light radiation refracted from the lens means to produce a single sampled portion;

means, acting upon the single sampled portion, for separating the reflected beam of non-visible radiation from the visible light radiation, the separation means having the characteristics of diverting the visible light radiation to a



viewfinder and transmitting the beam of non-visible radiation;

sensing means in the path of the transmitted beam of non-visible radiation for sensing a condition of divergence or convergence of the transmitted beam to provide an error signal; said sensing means comprising a double photo-sensitive cell, having adjacent photocell elements whose boundary is perpendicular to the path of movement of the transmittted beam of radiation as the object is brought into focus; and

servo means responsive to the error signal for adjusting the lens means to bring the object into focus.

4,150,889

INDICATING DEVICE FOR SINGLE LENS REFLEX CAMERA

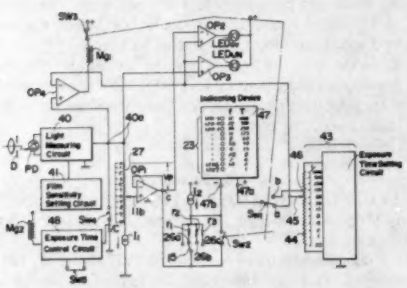
Horoshi Ueda, Nara; Kunio Kawamura, and Keiji Yamazaki, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 20, 1977, Ser. No. 834,971

Claims priority, application Japan, Sep. 29, 1976, 51-115958

Int. Cl.[2] G03B *7/08, 17/20*

U.S. Cl. 354—37 **5 Claims**



1. An exposure indicating device for a single lens reflex camera which is selectably settable to an automatic aperture control mode or to an automatic shutter speed control mode, and the camera including a camera body having first and second information receiving members, an exchangeable lens being mountable on said camera and having a diaphragm and an objective lens, and indicating means having a pair of input terminals for indicating exposure factors in accordance with the difference between the signals to said input terminals, said exposure indicating device comprising:

means for aperture setting provided on said exchangeable lens and being settable to a desired one of a plurality of manually set aperture positions;

a first information transmitting member provided on said aperture setting means for transmitting to said first information receiving member first information of the step-difference from a minimum to the preset f-number of said exchangeable lens independently of the set position of said aperture setting means;

a second information transmitting member provided on said aperture setting member for transmitting to said second information receiving member second information of a maximum f-number of said exchangeable lens with said aperture setting means set to a maximum f-number setting position;

means coupled with said first and second information receiving members for generating a first signal representative of said first information, and for combining said first and second information to generate a second signal representative of the minimum f-number of said exchangeable lens with said aperture setting means set to said maximum f-number setting position;

means for generating a third signal representative of the manually selected shutter speed;

means for generating a fourth signal representative of the set film-sensitivity and the intensity of the light from an object passed through said objective lens and the aperture formed by said diaphragm, said fourth signal generating means being connected with said first and second signal generating means such that the sum of said first and fourth signals is obtained with said aperture setting means set to any one of said plurality of manually set aperture positions and such that the sum of said second and fourth signals is obtained with said aperture setting means set to said maximum f-number setting position;

means for generating a fifth reference signal;

manually operable mode selection means provided on said camera body;

means coupled with said mode selection means for selectively setting said camera to the automatic aperture control mode or automatic shutter speed control mode;

means responsive to said mode selection means for applying to one input terminal of said indicating means the sum of said first and fourth signals upon selection of the automatic shutter speed control mode and the sum of said second and fourth signals upon selection of the automatic aperture control mode; and

means responsive to said mode selection means for applying to the other input terminal of said indicating means said third signal upon selection of the automatic aperture control mode and said fifth signal upon selection of the automatic shutter speed control mode.

4,150,890

DEVICE IN CAMERA SHUTTER FOR MAINTAINING SEPARATE BLADES IN INTIMATE CONTACT WITH EACH OTHER

Tadashi Nakagawa; Mitsuo Koyama, and Eiichi Onda, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 20, 1976, Ser. No. 688,312

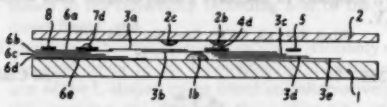
Claims priority, application Japan, May 22, 1975, 50-69651[U]

Int. Cl.[2] G03B *9/40*

U.S. Cl. 354—246 **1 Claim**

1. A camera shutter mechanism comprising: two spaced apart plates having means therein defining a shutter aperture; at least one group of blades disposed between said plates and movable in a predetermined plane between a first position in which the blades cover the shutter aperture and a second position in which the blades uncover the shutter aperture; and

means including one projection on at least one of said plates and another projection on the other of said plates coacting with said one projection for urging the blades of said group



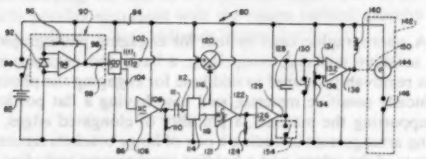
into intimate contact with each other in a direction normal to said plane when the blades are in said first position so as to maintain the blades of said group in a plane parallel to said predetermined plane when the blades are in said first position.

4,150,891

EXPOSURE CONTROL APPARATUS INCLUDING RATE RESPONSIVE LAG COMPENSATION

Thomas H. Close, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,443
Int. Cl.[2] G03B *7/08, 15/03*
U.S. Cl. 354—32 **5 Claims**



1. In an exposure control apparatus of the type including means for producing a light-dependent signal representing the intensity of light reflected from a scene, means for producing an integrated signal representing the time integral of said light-dependent signal, lag compensation means, coupled to said light-dependent signal producing means, for producing a first lag compensation signal proportional to the magnitude of scene light intensity at the time that an exposure termination signal is produced, means for adding said first lag compensation signal to said integrated signal to produce said exposure termination signal for adjusting an exposure interval to compensate for a time delay of said exposure control apparatus from the time at which said exposure termination signal is produced to the time at which actual termination of an exposure occurs, the improvement comprising:

means for producing a second lag compensation signal proportional to the instantaneous value of the time rate of change of said light-dependent signal at the time that said exposure termination signal is produced for further adjusting the exposure interval,

whereby exposure error during extremely close-up flash operation is substantially reduced.

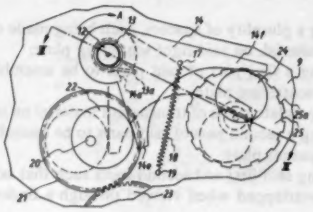
4,150,892

TONER DISPENSING DEVICE FOR AN ELECTROSTATIC COPIER

Günther Schnall, Eching; Erich Schlick, Riedmoos, and Hanns Blöchl, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 1, 1977, Ser. No. 829,984
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639666
Int. Cl.[2] G03G *15/00, 15/06*
U.S. Cl. 355—3 DD **5 Claims**

1. In an electrostatic copier, a combination comprising a developing station at which latent electrostatic images are developed by attracting toner particles to them; a toner supply; and means for transporting toner from said toner supply to said developing station, including a rotatable transporting element having a shaft, a rotatable eccentric cam spaced from said shaft, a pivot arm pivotable into and out of engagement with said eccentric cam, a freewheel drive connecting said shaft with said pivot arm, and adjustable stop means for limiting the movement of said pivot arm in direction towards said eccentric cam to a selectable extent, whereby the amount of toner transported to said developing station by said transporting element per unit time varies as a function of the selection of said extent, said stop means comprising an eccentric element and a handgrip on the same, and said eccentric element being a turnable knob having an outer gripping side facing away from the copier and an inner side facing towards the copier, means for yieldably urging said knob towards the copier, and cooperating detents on said inner side and the copier.

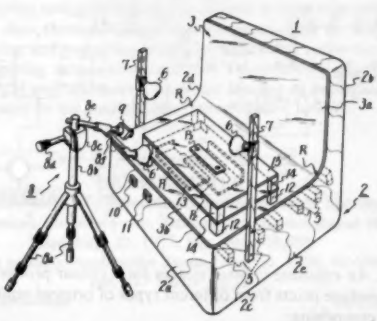


4,150,893

APPARATUS FOR TAKING A PHOTOGRAPH AND METHOD THEREOF

Yoshikazu Ueno, Yokohama, and Seiichi Hirano, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,768
Claims priority, application Japan, Jul. 6, 1976, 51-80125
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—18 **6 Claims**



1. An apparatus for photographically providing an exploded perspective view of a plurality of parts to be assembled, comprising:

a cabinet having an opening at its upper side and a light source therein;

a light scattering plate made of semi-transparent material and covering said opening of said cabinet to support at least one of said parts;

a plurality of spacers, each being made of transparent material and movably located on said light scattering plate;

at least one plate made of transparent material and detachably located on said spacers to support another one of said parts;

light source means irradiating said plate of transparent material; and

a camera for photographing said parts with said parts being located on said light scattering plate and said transparent plate in such a manner that they are not overlapped when viewed from said camera.

6. A method of photographically providing an exploded perspective view of a plurality of parts to be assembled, comprising the steps of:

preparing a light scattering plate with a light source thereunder;

locating a plurality of spacers, each being made of transparent material, on said light scattering plate;

disposing a first part of said parts to be assembled on said light scattering plate;

locating a plate made of transparent material on said spacers;

disposing a second part of said parts to be assembled on said transparent plate;

arranging said first and second parts such that said parts are not overlapped when viewed through a finder of a camera;

irradiating said first and second parts with light about all the circumferences thereof; and photographing the arranged parts by means of said camera.

4,150,894

EXPOSURE CONTROL SYSTEM FOR COLOR PRINTERS

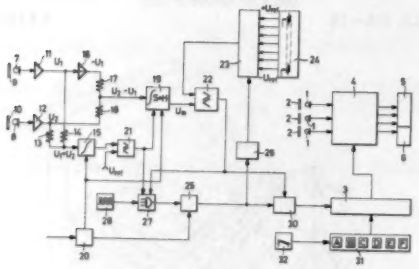
Armin Meyer, Belfaux; Jörg Müller, St. Silvester; Bruno Brändli, Ependes, and Robert Wahli, un Terengstrigen, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Jan. 27, 1978, Ser. No. 872,924

Claims priority, application Switzerland, Feb. 1, 1977, 1182/77

Int. Cl.² G03B *27/78*; G01N *21/06, 21/22*

U.S. Cl. 355—38 **7 Claims**



1. An exposure control system for a colour printer adapted to produce prints from different types of original colour material comprising:

(1) photo-electric means for determining the colour density of an original;

(2) a store for storing sets of exposure parameters, each set being associated with a different original material;

(3) means for spectral analysis of an original;

(4) means responsive to said spectral analysis means to form a coefficient representative of that original;

(5) classification means for classifying each coefficient in one of a plurality of ranges of coefficient reference values, each range being characteristic of a different original material;

(6) means responsive to said classification means for automatically selecting a set of exposure values from said store that is associated with the respective coefficient reference range of values in which the coefficient for a particular original is classified by said classification means.

4,150,895

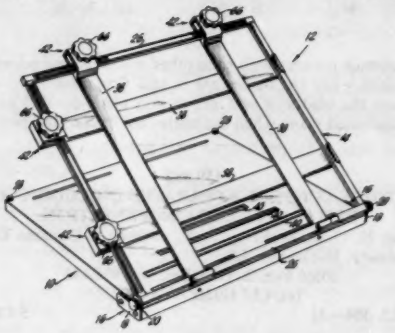
PHOTOGRAPHIC EASEL SYSTEM

Daniel Northrup, Scottsville, and Steven Hess, Rochester, both of N.Y., assignors to Saunders Photo/Graphic Inc., Rochester, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,372

Int. Cl.² G03B *27/58*

U.S. Cl. 355—74 **30 Claims**



1. A photographic easel system for engaging photographically sensitive material, comprising: a base, and engagement means removably secured to said base for engaging the photographically sensitive material; said base having a flat portion for supporting the material, a plurality of elongated edges, a hinging arrangement including a pair of hinge brackets secured to a pair of the edges, and a holding arrangement including a vertical portion extending vertically relative to the flat portion along one of the edges with said vertical portion having a pair of threaded openings and said flat portion having a plurality of slots parallel to the one of the edges; said engagement means being securable to one of said hinging arrangement and said holding arrangement.

4,150,896

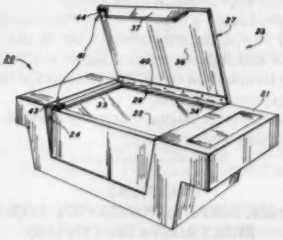
COPYING APPARATUS COVER

William G. Wakeman, Lafayette, Calif., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 868,094

Int. Cl.² G03B *27/62*

U.S. Cl. 355—75 **8 Claims**



1. A cover and original document keep device for copying apparatus having a housing and platen surface comprising:

(A) a vertically movable support structure having an elongated support member incorporating a plurality of positioning rods extending downwardly therefrom,

(B) means forming positioning holes in the copying apparatus housing, the positioning rods being slidingly engaged within the positioning holes thereby providing vertical sliding mobility to the support structure;

(C) an L-shaped cover frame comprising two elongated arms, one arm being longitudinally pivotally mounted by

a first hinge means to the support structure, the other arm extending outwardly at an angle therefrom;

(D) a rigid cover pivotally mounted by a second hinge means to the outwardly extending arm of the L-shaped cover frame; and

(E) holding means for independently and releasably securing the rigid cover to the longitudinally pivotally mounted arm of the L-shaped cover frame and alternatively releasably securing the outwardly extending arm of the L-shaped cover frame to the copying apparatus surface, comprising easily attachable and detachable fasteners, thereby allowing selection of pivotal operation about either pivotal axis of the first hinge means or the second hinge means and eliminating any pivotal operation about the unselected axis,

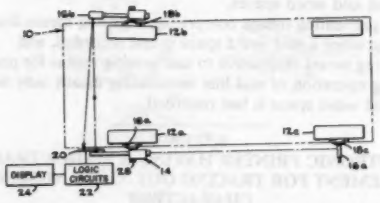
whereby selection of pivotal operation about either pivotal axis of the first hinge means or the second hinge means permits accommodation of thin original documents, and whereby selection of pivotal operation about the pivotal axis of the first hinge means coupled with a rocking levered lowering movement of the rigid cover over a thick original document on the platen causes vertical sliding elevation of the support structure, allowing accommodation for thick original documents while still allowing the user to maintain the rigid cover in substantially parallel alignment with the platen surface, thereby providing effective user radiation protection.

4,150,897

WHEEL-MOUNTED VEHICLE WHEEL ALIGNER

Thomas E. Roberts, Jr., Saratoga; James L. Wiederrich, Lodi; Melvin H. Lill, San Jose, and Andrew K. Chang, Malibu, all of Calif., assignors to FMC Corporaton, San Jose, Calif.

Filed Mar. 2, 1977, Ser. No. 773,638
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—152 **17 Claims**



1. Apparatus for measuring wheel alignment of a motor vehicle comprising:

means for projecting a directional beam of light;

means for attaching said projecting means to a first wheel of said vehicle for projecting said directional beam with the longitudinal axis of said beam being in a predetermined angular relationship to a line generally parallel to the axis of rotation of said first wheel;

a multichannel photosensitive encoder positioned to intercept said beam, said encoder having means for generating a plurality of binary signals indicative of the distance between the position on said encoder at which the light beam is intercepted and a reference position thereon;

means for automatically modifying said binary signals in accordance with the distance between said projecting means and said encoder; and

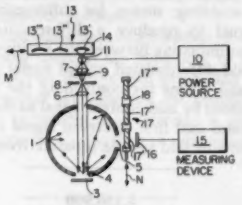
means responsive to said binary signals for indicating an angular position of said wheel.

4,150,898

COLORIMETER EMPLOYING PRIMARY FILTER MIRRORS

Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan

Filed Aug. 31, 1977, Ser. No. 829,460
Claims priority, application Japan, Feb. 2, 1977, 52-011841
Int. Cl.[2] G01J *3/46*
U.S. Cl. 561—405 **13 Claims**



1. A colorimeter comprising:

means for supporting a color sample;

a light source;

means for receiving and measuring amounts of primaries or tristimulus values in quantities of light;

means for directing a first quantity of light directly from said light source to a color sample supported by said supporting means and from said color sample toward said receiving and measuring means;

a plurality of primary filters;

means for positioning a selected of said primary filters in front of said receiving and measuring means such that said first quantity of light passes through said selected primary filter before being received by said receiving and measuring means; and

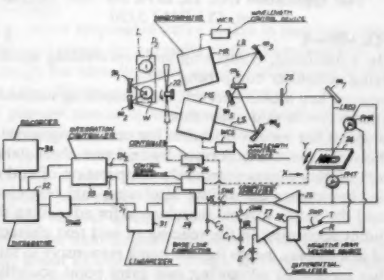
a plurality of primary filter mirror means, selectively positionable to receive a second quantity of light from said light source, for reflecting and changing the spectral characteristics of said second quantity of light and for then directing said second quantity of light to said color sample and then through said selected primary filter to said receiving and measuring means, whereby said receiving and measuring means simultaneously receives two quantities of light and measures a resultant amount of said selected primary or tristimulus value therefrom.

4,150,899

DENSITOMETER

Kengi Nakamura, c/o Shimadzu Seisakusho Sanjo Factory, 1, Nishinokyo Kuwabara-cho, Nakagyo-ku, Kyoto, Japan (604)

Filed Aug. 29, 1977, Ser. No. 828,551
Claims priority, application Japan, Aug. 31, 1976, 51-104658
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—444 **14 Claims**



1. A densitometer comprising: means for providing mono-

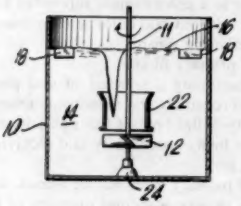
chromatic light; means for supporting a sample to be measured; optical means for directing said monochromatic light to said sample; means for effecting a relative zigzag movement between said light and said sample; photoelectric means for receiving said light from said sample to produce a corresponding first electrical signal; means for integrating said first electrical signal; means for receiving said first electrical signal to produce a second electrical signal corresponding to an envelope connecting the peaks of said first signal in the strokes of said zigzag scanning; means for differentiating said second electrical signal to produce a differentiated output signal; means for discriminating between the positive and the negative polarity of said differentiated output signal to produce a control signal; and means for controlling the operation of said integrating means by said control signal so that said integrating means integrates said first electrical signal caused by each of the components of said sample separate from the others.

4,150,900

SLURRY MIXER

Dean L. Smith, Jr., Mountainside, and Barry L. Tarmy, Berkeley Heights, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 30, 1977, Ser. No. 838,558
Int. Cl.[2] B01F 7/16
U.S. Cl. 366—302 **19 Claims**



1. A mixing system for buoyant particle slurry comprising: a tank for containing said slurry; liquid agitator means disposed within said tank including an agitator blade located substantially near the bottom thereof; baffle means comprising a plurality of baffles for continuously aiding in the mixing of said slurry situated only substantially in the vicinity of the slurry liquid level in said tank at a given instant of time and situated adjacent the wall of said tank.

4,150,901

JUSTIFYING TEXT WRITING COMPOSING MACHINE

William S. Gubelmann, deceased, late of Convent, N.J.; by Walter S. Gubelmann, executor, Palm Beach, Fla., and William R. Grier, New Vernon, N.J., assignors to R & I Patent Corporation, Morristown, N.J.

Division of Ser. No. 213,045, Dec. 28, 1971, Pat. No. 3,993,179.
This application Oct. 15, 1976, Ser. No. 733,120
Int. Cl.[2] B41J 5/30
U.S. Cl. 400—4 **3 Claims**

1. In a justifying, composing and reproducing apparatus, a justifying composer comprising

character key means operable for composing successive text characters in said apparatus,

a a space bar means operable for composing word spaces between the words formed by said text characters,

a text display means responsive to operation of said character key means for visibly displaying said text characters and the words formed thereby and for advancing the print point according to the spacing of said text characters,

said text display means further being responsive to said space bar means for advancing said print point according to a word space upon operation of said space bar means,

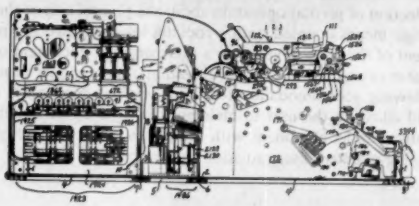
an encoding means responsive to operation of said character key means and said space bar means for progressively storing codes representing each of said text characters and said word spaces,

a line terminaating means operable for producing and end of line signal,

said text display means being responsive to operation of said line terminating means and said end of line signal for shifting said print point from the end of one line to the beginning of a succeeding line whereby said text display means stands ready for the composition of a succeeding line,

a printer means for producing a copy comprising successive lines of the words formed by said codes a printer control means connected to said encoding means for receiving said codes from said encoding means,

said printer control means being connected to said printer means for controlling said printer means to produce said copy according to said codes,



said encoding means being responsive to operation of said line terminating means and said end of line signal for storing an end of line code and for simultaneously transferring said codes and said end of line code into said printer control means,

whereby said printer control means controls said printer means to produce a printed line according to said codes and said end of line code at the same time said apparatus is ready to be operated for the composition of a succeeding line of text,

a space at end of line preventing means responsive to operation of said character key means and said space bar means for recording the successive order of said text characters and said word spaces,

said preventing means comprising a sensing means for sensing when a said word space is last recorded, and

locking means responsive to said sensing means for preventing operation of said line terminating means only when a said word space is last recorded.

4,150,902

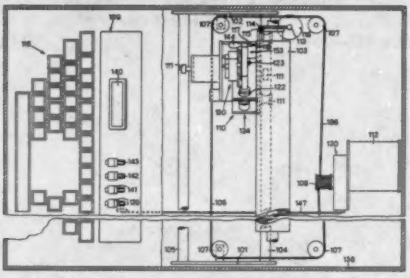
ELECTRONIC PRINTER HAVING A SINGLE TRACING ELEMENT FOR TRACING OUT ALPHANUMERIC CHARACTERS

Riccardo Brescia, Ivrea, Italy, assignors to Ing. C. Olivetti & Co., S.P.A., Italy

Filed Jul. 8, 1977, Ser. No. 814,135
Claims priority, application Italy, Jul. 19, 1976, 68797 A/76; Jun. 10, 1977, 68353 A/77
Int. Cl.[2] B41J 3/04
U.S. Cl. 400—17 **44 Claims**

1. An electronic printer having a single tracing element for tracing alphanumeric characters, comprising spacing means for relatively moving said tracing element and the paper in a letter spacing relationship, driving means for shifting said tracing element along a pair of coordinates parallel to the printing plane independently of the said letter spacing, for tracing each character, storing means for storing a set of addressable numerical instructions for each one of said characters, addressing means conditionable for sequentially addressing the instructions of a predetermined character, printing control means operable for conditioning said driving means according to a character to be printed, detecting means for

detecting the position of said tracing element, D/A converting means for converting the numerical instructions so addressed into command signals, comparison means for comparing the



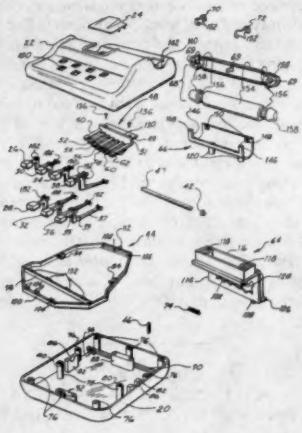
signals given by said detecting means and by said converting means, and servo control means conditioned by said comparison means for controlling said driving means.

4,150,903

TYPEWRITER-LIKE TOY

Charles E. Bailey, Lawndale; Sidney Bass, Los Angeles, and Russell C. Edmisson, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 10, 1977, Ser. No. 758,206
Int. Cl.[2] B41J *3/02*
U.S. Cl. 400—95 **10 Claims**



1. In a toy typewriter-like instrument, the combination comprising:

a housing;

a platen for receiving paper thereon, said platen being mounted on a carriage for movement on said housing to move the paper past a print position;

a plurality of pivotable type arms mounted within said housing, each of said type arms having pads affixed to the free ends thereof with each of said pads having a type font thereon to imprint a different word of a pre-selected vocabulary;

a plurality of key members pivotally mounted within said housing to form two rows of keys, each of said key members coacting with a predetermined one of said type arms, the key member for a given type arm having a portion thereon carrying indicia corresponding to the word on the pad of said type arm, said type arms and said key members being configured to operate each of said pads to said print position in response to actuation of said keys;

a spacer frame rockably received within said housing about a pivot axis, one end of said spacer frame having a bar member portion disposed beneath each of said rows of said keys, each of said bar member portions extending in a line generally parallel to the pivot axis of said spacer frame;

an indexing projection on the end of said spacer frame opposite said bar member portions;

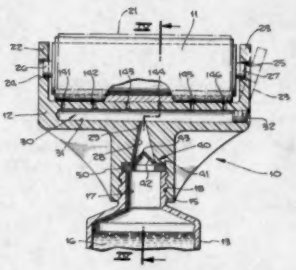
a downwardly extending indexing member on said carriage with an opening therein, the periphery of said opening being configured to receive said projection therein; and edge means within said opening for coacting with said projection to increment said carriage a predetermined distance in response to pivoting of said spacer frame.

4,150,904

ROLLER APPLICATOR WITH PRESSURE RESPONSIVE VALVE

Paul Stewart, 8272 Marmont La., Los Angeles, Calif. 90069

Filed Jul. 18, 1977, Ser. No. 816,701
Int. Cl.[2] B05C *17/02*; B43M *11/02*
U.S. Cl. 401—186 **2 Claims**



2. A fluid applicator having a fluid absorbant dispensing roller and a disposable, squeezable fluid storage container comprising:

an applicator head having a plurality of fluid dispensing ports in a generally linear array and roller mounting means for mounting said roller adjacent and aligned to said ports;

manifold means within said head in fluid communication with each of said ports;

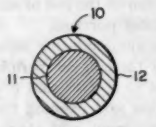
fluid inlet means in said head releasably connectable with said container for receiving fluid from said container into said head;

fluid pressure responsive valve means in said head adjacent said inlet means for normally preventing fluid flow therethrough but allowing same under fluid pressure developed by manually squeezing said container;

fluid passage means in said head for communicating fluid from said valve means to said manifold means, wherein said roller mounting means comprise a pair of resiliently bendable spaced arms formed integrally of said head whereby said roller may be assembled or disassembled through manual spreading of said arms; and

wherein said fluid dispensing ports are positioned symetrically about a center line through said applicator head and are spaced from each other in increasingly greater spacings between successive ports as the ports progress outwardly of said center line.

4,150,905
SPHERES OBTAINED BY VAPOR DEPOSITION FOR USE IN BALL POINT PENS
Richard B. Kaplan, Hollywood, and Sebastian Gonnella, Arleta, both of Calif., assignors to Ultramet, Pacoima, Calif.
Filed Feb. 9, 1977, Ser. No. 766,880
Int. Cl.[2] B43K 7/10
U.S. Cl. 401—215 19 Claims

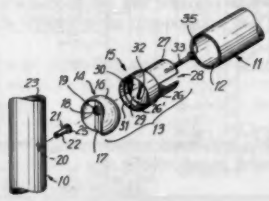


1. A ball particularly suitable for a ball point pen and comprising:
(a) a core consisting of a refractory material capable of withstanding a temperature in excess of 800° C.; and
(b) a coating on said core, said coating being deposited from the vapor phase by hydrogen reduction of a refractory metal halide, said core and coating having a combined diameter of from approximately 0.5 mm to approximately 1 mm and being substantially spherical.

4,150,906
CABLE LOOP CONNECTOR
Ronald V. Bernard, Rte. 2, Box 1420, Neotsu, Oreg. 97364
Filed Nov. 3, 1977, Ser. No. 848,237
Int. Cl.[2] F16G 11/00
U.S. Cl. 403—213 8 Claims

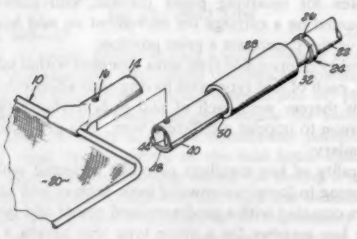
1. A one piece cable loop connector, comprising:
a. a body portion having therethrough a longitudinal opening which is of substantially uniform width in a first longitudinal plane and which is tapered in width in a second longitudinal plane perpendicular to said first longitudinal plane, and
b. an open hook portion extending longitudinally from the wider opening end of the body portion,
c. the terminal end of the open hook portion facing said wider opening end of the body portion.

4,150,907
STANCHION CONNECTOR ASSEMBLY
William Thurnauer, Teaneck, N.J., assignor to Julius Blum & Co., Inc., Carlstadt, N.J.
Filed Mar. 8, 1978, Ser. No. 884,648
Int. Cl.[2] F16B 7/08
U.S. Cl. 403—234 2 Claims



1. A connector assembly for effecting a butt joint connection between a tubular fixed stanchion member and a rail member comprising, in combination, a fixed connector component including an arcuate inner face adapted to mate with the outer surface of said stanchion, a parti-spherical outer face and a bore extending through from said inner to said outer face, said bore being disposed in a substantially radial direction with respect to the curves of said inner and outer faces, a movable connector component adapted to be clampingly engaged against said outer face of said fixed component, said movable component including an inwardly directed cylindrical collar having an end portion, the inner surface of said end portion of said collar having an outwardly directed annular bevel, the radius of curvature of said collar being less than the radius of curvature of said outer face of said fixed component, a concave clamp plate spaced outwardly of said cylindrical collar and fixedly connected thereto, said clamp plate including an arcuate surface having substantially the same radius of curvature as said outer surface of said fixed component, an arcuate slot formed in said clamp plate, a rail receiver shank fixed to said collar and extending in a direction opposite the direction of concavity of said clamp plate, said shank being adapted to receive and rigidly support said rail member thereon, and a bolt member extending through said slot of said clamp plate and said aperture of said fixed component and threadedly engaging a portion of said stanchion, thereby clampingly to engage said inner face of said fixed member against said stanchion and said end portion of said collar against said outer surface of said fixed member, the angular orientation of said fixed and movable members being variable within the limits provided by said arcuate slot.

4,150,908
QUICK CONNECT ASSEMBLY
Herbert H. Friedrich, 2137 N. Malton Ave., Simi Valley, Calif. 93063
Filed May 23, 1978, Ser. No. 908,871
Int. Cl.[2] F16B 2/14; F16D 1/00; F16L 23/00
U.S. Cl. 403—341 9 Claims



1. A coupling assembly for attaching an accessory tool to a

pole, the pole having an outside pole surface and the accessory tool having a laterally cut-away mounting portion shaped for being positioned adjacent to the outside pole surface, the coupling assembly comprising:

a wedge member for being attached to the pole, the wedge member having an outside wedge surface tapered along its length;

registration means for aligning the mounting portion and the pole in longitudinally immovable relationship and for aligning the mounting portion generally opposite to and in non-contacting relationship with the wedge member; and

a locking sleeve having an interior surface, the locking sleeve means slidably mounted on the pole for being positioned in clamping relationship against the mounting portion and in wedging relationship against the outside wedge surface of the wedge member for rigidly and immovably clamping the mounting portion of the accessory tool to the pole.

4,150,909

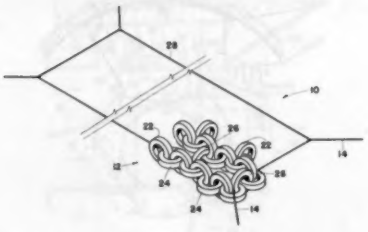
BREAKWATER SYSTEM

George E. Hibarger; George G. Hibarger, and David W. Daniel, all of P.O. Box 7531, all of Tulsa, Okla. 74105

Filed Jan. 9, 1978, Ser. No. 867,801

Int. Cl.[2] E02B *3/12*

U.S. Cl. 405—27 **11 Claims**



1. A spliced vehicle tire comprising:

(a) a vehicle tire radially severed to form a pair of abutting ends;

(b) a pair of apertures through the tire material oppositely disposed on either side of the sever, a pair of elongated slits in the tire material, one in communication with each aperture and extending in opposite directions;

(c) an elongated splice member comprising an elongated strip, the cross-sectional size of the strip being compatible with the size of the apertures, a pair of enlarged end lobes, one on each end of the strip, the size of each end lobe being compatible with the combined length of the elongated slit and aperture;

whereby each end lobe is removably insertable in opposite apertures in order to hold the tire in substantially annular configuration.

4,150,910

CONSTRUCTION OF UNDERGROUND GALLERIES

Carlos E. M. Maffei, Sao Paulo, Brazil, assignor to Promon Engenharia SA, Sao Paulo, Brazil

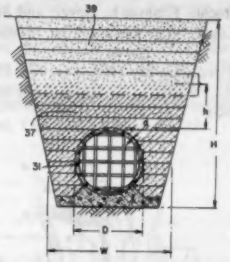
Filed Sep. 23, 1977, Ser. No. 836,105

Claims priority, application Brazil, Aug. 19, 1977, 770555

Int. Cl.[2] F16L *9/22*; E01G *5/06*; E21D *9/00*

U.S. Cl. 405—149 **24 Claims**

1. A method of constructing an underground gallery comprising excavating to form a pit having a depth greater than the overall height of the gallery, locating the gallery within the pit, internally bracing the structure of said gallery to withstand loads exerted by ground material upon refilling of the pit, covering the gallery and filling the pit with ground material, said covering being effected initially by applying and compacting backfill material in incremental steps around and over the gallery, removing said bracing from within the gallery and thereby causing said initially applied backfill material to adopt



an internal arching structure which together with said gallery will support applied loads, and completing the filling of the pit.

4,150,911

CONTROL DEVICE FOR THE LAYING OF PIPE IN DEEP WATER

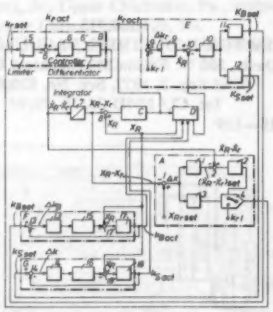
Werner Droste, Hamburg, Fed. Rep. of Germany, and Walter Adler, Den Haag, Netherlands, assignors to Licentia Patent-Verwaltungs-G.m.b.H, Frankfurt, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,314

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1976, 2648264

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—177 **7 Claims**

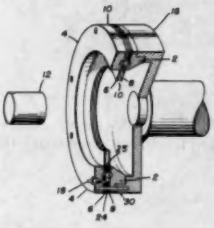


1. In a system for controlling the laying of a pipeline in deep water, with a combined pipe laying barge displacement and pipe tension control, from a pipe laying barge arranged to advance in a stepwise manner in the pipeline laying direction and to pay out the pipe in successive sections of predetermined length, the system including a tensioner associated with the pipe laying barge for exerting a controllable holding force on the pipeline, the improvemment comprising means operative simultaneously with the acceleration of the pipe laying barge in the laying direction during each stepwise advance for adjusting the tensioner holding force downwardly from an upper limit value to a lower limit value under control of a parameter which is the displacement of the pipeline relative to the pipe laying barge.

4,150,912
TWIN BLADE MOUNTING AND TENSIONING APPARATUS

Henry W. Gutsche; Thomas L. Bever, and John T. Hepperman, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 23, 1978, Ser. No. 871,276
Int. Cl.[2] B26D 1/12; B24B 7/00; B28D 1/04
U.S. Cl. 407—31 11 Claims

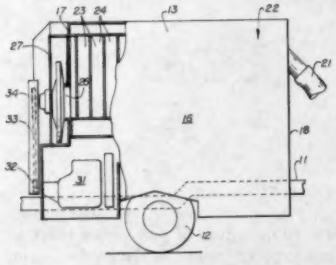


1. A twin blade mounting and tensioning apparatus comprising first and second annular clamping-tensioning members for clamping a first annular blade and a second annular blade, an outer annular shim and an inner annular shim located between the first and second blades, said shims being spaced apart defining an annular fluid expansion chamber between the twin blades, said annular clamping-tensioning members in circumferential alignment and located axially outwardly from said expansion chamber confronting a first wall of each blade while said expansion chamber confronts a second wall of each blade, said annular clamping-tensioning members having annular recessed chambers in register with the fluid expansion chamber, at least one of said annular clamping-tensioning members having fluid entry and exit channels which are in communication with the annular fluid expansion chamber, said blade walls between the expansion chamber and said recessed annular chambers being flexible and deformable within said recessed chambers.

4,150,913
BLOWER FOR INDUSTRIAL VACUUM MACHINE

Henry J. Davis, 350 N. Edison St., Stockton, Calif. 95203

Filed Sep. 2, 1977, Ser. No. 830,021
Int. Cl.[2] F04D 24/28, 29/66
U.S. Cl. 415—119 2 Claims

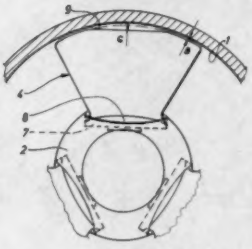


1. A blower comprising a scroll casing, an impeller inside said scroll having a hub, means for rotating said hub, said impeller having a body having a rear face and a forward face, said forward face in cross-section curving rearwardly-outwardly and then radially outward relative to the axis of said hub, a plurality of equiangularly spaced blades extending approximately perpendicularly forward from said forward face and an annular forward member forward of said blades having a flat planar rearward face slanting forwardly-inwardly from the periphery of said impeller and terminating in a forward directed, substantially cylindrical flange, a stationary collar mating with said flange to direct air rearward between said blades, each said blade extending from an inner terminus spaced outward of said collar to an outer terminus at the periphery of said impeller, each said blade slanting forward-outwardly in the direction of rotation of said impeller and curving in a concave-convex shape relative to a base line between the inner and outer terminus, said blade being spaced forward of said base line in said direction of rotation, the thickness of said blade being about 25% greater midway of the distance between said termini than at either terminus, said blades overlapping, the angle between lines tangent to the forward faces of said blades adjacent said inner termini being about 50% less than the angle between lines taught to the forward faces of said blades adjacent said outer termini.

4,150,914
PROPELLER BLADES

Stig O. Karlsson, Kristinehamn, Sweden, assignor to AB Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Aug. 22, 1977, Ser. No. 826,753
Claims priority, application Sweden, Dec. 20, 1976, 7614288
Int. Cl.[2] F01D 5/20
U.S. Cl. 415—129 3 Claims



1. Propeller blade for use in a propeller arrangement comprising a propeller hub rotatably mounted around an axis of rotation, a plurality of propeller blades mounted in said propeller hub, shafts on said blades mounted inside said propeller hub for mounting said blades to be pivotable between a first operative position in which vanes of the blades extend transverse to the axis of rotation and a second mounting and demounting position in which the vanes extend substantially parallel to said axis of rotation, bearings for said shafts in the propeller hub each having a pivoting axis substantially radial to the axis of rotation of the hub and including a space for the accommodation of a shaft located inside the outer peripheral edge of the hub, and a shroud for said blades having a circular wall substantially concentric relative to the axis of rotation of the hub, each blade vane comprising a front and a rear edge extending substantially in a radial direction from said axis of rotation of the hub when the blade is mounted in the hub and an outer edge with portions having the shape of a peripheral arc departing from said axis of rotation of the hub when the blade is mounted in the hub and extending in the space between the front and the rear edge of the vane, said portions of the outer edge of the blade vane in said first operative position of the blade being at a distance from said shroud wall which is smaller than the distance between the innermost surface of its respective shaft and the peripheral edge of the hub, said portions of the outer edge of the blade vane being provided adjacent to the front edge and the rear edge of the blade vane and there is provided a centric portion of the outer edge of the blade vane which extends inside an arc forming a circular connection between said outer edge portions of peripheral arc shape, said centric portion having a play relative to said shroud wall which is at least equal to said distance between the inner-

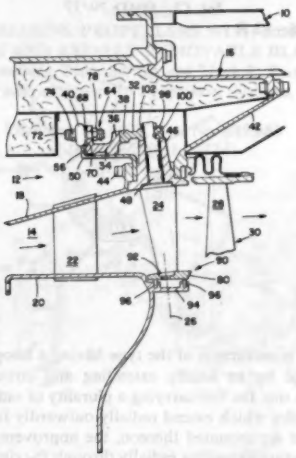
most surface of its respective shaft and the peripheral edge of the hub.

4,150,915

VARIABLE GEOMETRY TURBINE NOZZLE

Karl W. Karstensen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 23, 1976, Ser. No. 730,044
Int. Cl.[2] F01B 25/10; F01D 17/16, 25/26; F16K 31/44
U.S. Cl. 415—139 17 Claims



1. In a movable vane assembly of the type used in a gas turbine engine or compressor for interaction with a gas stream comprising a plurality of radially aligned vanes circumferentially arranged within an annular passage formed by a housing, said vanes being supported for rotation about their radial axis to vary the effective cross-sectional area of said annular passage, a plurality of rotatable gear means connected for rotation with said aligned vanes, a ring gear having teeth means adapted for simultaneous engagement with teeth means of said rotatable gear means such that rotation of said ring gear causes rotation of said vanes, an outer shroud supportingly connected to said housing and an inner shroud radially inwardly spaced from said outer shroud, an improvement comprising:

a plurality of circumferential thrust segments in one to one relation with said plurality of vanes, each of said segments having a well therein generally centrally thereof, adjacent ones of said segments having overlapping means, said segments fitting together via said overlapping means to form a close fitting shroud;

a plurality of extending members, one proceeding inwardly radially along the rotational axis of each of said vanes, said extending members each being in rotatable supporting relation with a respective one of said segments within a respective one of said wells; and

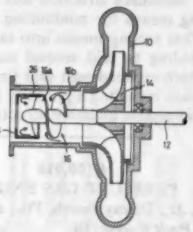
a collar extending from said inner shroud inwardly radially of said close fitting shroud in supporting relation thereto.

4,150,916

AXIAL FLOW INDUCERS FOR HYDRAULIC DEVICES

Toshiaki Tsutsui; Akira Oyamada; Tomomitsu Hamaguchi, and Akihiko Agata, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Division of Ser. No. 606,467, Aug. 21, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,041
Claims priority, application Japan, Mar. 13, 1975, 50-30587; Mar. 13, 1975, 50-30588; Mar. 13, 1975, 50-30589
Int. Cl.[2] F04D 13/12, 17/14
U.S. Cl. 415—143 7 Claims



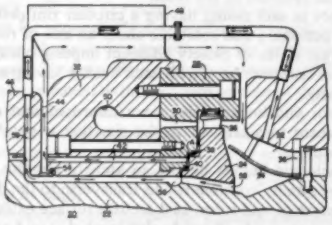
1. An axial flow inducer for hydraulic devices comprising a pump casing, a rotary shaft rotatably journaled by said pump casing, a main impeller secured to said rotary shaft, and an inducer having axial flow blades coaxially arranged in front of a fluid suction inlet side of said main impeller a sleeve extending forwardly of the front of said inducer and having one end secured to the outer peripheral edge of said inducer and the opposite end bent inwardly and spaced from the front of said inducer so as to form a barrier, said axial flow blades being constructed and arranged so as to prevent an occurrence of noise over the region of said impeller.

4,150,917

ROTOR COOLING FOR SINGLE AND DOUBLE AXIAL FLOW TURBINES

George J. Silvestri, Jr., Upper Chichester, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1977, Ser. No. 806,404
Int. Cl.[2] F01D 25/00, 11/00
U.S. Cl. 415—168 5 Claims



1. An elastic fluid turbine apparatus comprising:

a first motive fluid expansion stage and a second motive fluid expansion stage arranged in series flow relation with each other and having identical motive fluid axial flow directions therethrough;

said first stage including a stationary structure having an annular row of nozzle vanes and an annular nozzle chamber structure situated adjacent said nozzle vanes for distribution of motive fluid thereto;

a rotor structure having a disc portion disposed adjacent said stationary structure, said disc portion having a first annular row of blades circumferentially disposed thereon

which are cooperatively associated with said nozzle vanes;

said rotor structure having a reduced diameter portion extending axially upstream from said first blade row;

said stationary structure being annular in shape is disposed in closely spaced encompassing relation with said reduced diameter rotor portion and jointly therewith define a cooling space;

said rotor disc portion having a plurality of apertures therein for pumping a portion of the motive fluid exiting the first stage through said disc and cooling space;

first sealing means for minimizing motive fluid leakage between said stationary structure and said disc;

second sealing means for minimizing motive fluid leakage from said first sealing means into said cooling space; and

means for guiding to said second stage said motive fluid leakage which escaped past said first sealing means, said guiding means including a plurality of openings extending through said nozzle chamber structure.

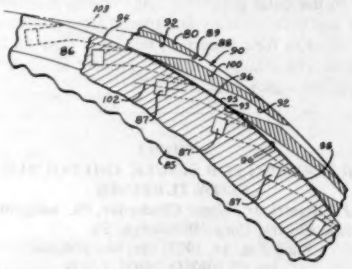
4,150,918
PRESSURE GAS ENGINE

James V. Theis, Jr., Delray Beach, Fla., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 651,052, Jan. 21, 1976, abandoned, which is a division of Ser. No. 553,978, Feb. 28, 1975, Pat. No. 3,976,389. This application Feb. 9, 1977, Ser. No. 766,906

Int. Cl.[2] F01D *5/14, 9/04, 1/02*

U.S. Cl. 415—202 **20 Claims**



1. A pressure gas engine, comprising:

(1) an enclosing casing having a gas flow exhaust comprising gas flow outlet openings of low back pressure relative to the absolute pressure of the blast;

(2) a rotor in said casing having a circular rim defined by an outer periphery and rotatable about an axis of rotation;

(3) a single series of closely adjacent impulse buckets in said rotor at said periphery with each bucket having an entrance and exit,

(a) each said bucket lying on a chord of said rim that is adjacent to a tangent to the rim that is parallel to said chord,

(b) each said bucket having an arcuate impulse surface of substantially constant radius transverse to the direction of rotation of said rotor, said arcuate surface extending from an entrance side of said bucket located at said periphery to an opposite exhaust side of the bucket also located at said periphery,

(c) each said exhaust side exhausting directly into said gas flow exhaust of said relatively low back pressure;

(d) said circular rim being provided with a flat substantially square recess outwardly of, and adjacent to, each said bucket and said flat recess being located in alignment with the bucket entrance and exit sides, the square extending between the outer extremities of said entrance and exit sides of its respective bucket

(4) nozzle means comprising an arcuate series of gas nozzles in said casing closely adjacent to said rim, each said nozzle having an axial gas passage substantially aligned with said entrance sides during rotation of the rotor for providing a high velocity blast of gas through each said nozzle, through said buckets and directly into said gas flow exhaust in a single pass through said buckets,

(a) said nozzle passages being located at and substantially linearly aligned with said bucket entrances and said nozzle means comprising blast directing means for directing substantially all of each said nozzle blasts directly into said bucket entrances for flow over said impulse surfaces and from said bucket exits, said gas blast thereby entering and leaving said rotor at said rim periphery,

(b) the blast directing means including a flow directing member locating the outer boundary of each said gas blast at said periphery; and

(5) means for supplying pressurized gas to all said nozzle means.

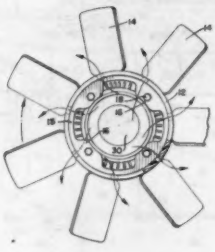
4,150,919
RADIATOR COOLING FAN CONSTRUCTION

Joseph V. Matucheski, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,393

Int. Cl.[2] F04D *29/32*

U.S. Cl. 416—93 R **2 Claims**



1. A fan construction of the type having a hoop configured hub defined by an axially extending and circumferentially continuous rim, the rim carrying a plurality of radially extending fan blades which extend radially outwardly from its outer surface and are mounted thereon, the improvement comprising, an aperture extending radially through the rim and located adjacent each fan blade and axially behind the leading edge of the fan blade, each aperture located on the suction side of its associated blade, whereby rotation of the fan causes ambient air to pass radially through the rim apertures, the said apertures and the said radially outwardly extending fan blades acting during rotation of the fan to define the sole means for causing radial air movement through said hub apertures.

4,150,920
ROTOR BLADE TIPWEIGHT ASSEMBLY

Raymond P. Belko, Blackwood, N.J., and Robert C. Huss, Glen Mills, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

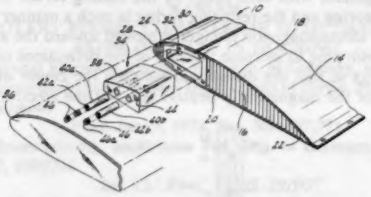
Filed Dec. 2, 1977, Ser. No. 856,715

Int. Cl.[2] B64C *11/16, 27/46*

U.S. Cl. 416—145 **3 Claims**

1. A rotor blade balancing weight assembly secured within the rotor blade spar proximate the free-end thereof, said balancing weight assembly including a weight tube housing, a cylindrical weight tube fixed within said housing, positioned with its longitudinal axis parallel to the longitudinal axis of the spar, said weight tube being internally threaded, forming an internally threaded bore, cylindrical balancing weights within the weight tube, said weights having outside diameter equal to the inside diameter of the weight tube, said weights being externally threaded with threads which matingly match the

internal threads of the weight tube, the threads being such that a fit engagement is obtained preventing a weight from moving within the weight tube while allowing the weights to be positioned independently within the weight tube to provide both



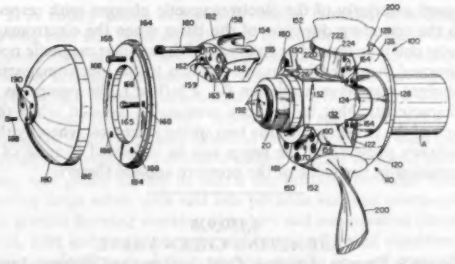
spanwise and chordwise rotor blade balance, means for turning the weights within the tubes to position them within the tube, and a blade tip cover member covering the free-end tip of the spar.

4,150,921

BUILT-UP MARINE PROPELLERS WITH ADJUSTABLE PITCH AND AXIALLY REMOVABLE BLADES

Peder K. Wennberg, Federal Way, and Mark E. Eastman, Kent, both of Wash., assignors to Propulsion Systems, Inc., Kent, Wash.

Filed Jul. 28, 1977, Ser. No. 819,883
Int. Cl.[2] B63H *3/12*
U.S. Cl. 416—207 **8 Claims**



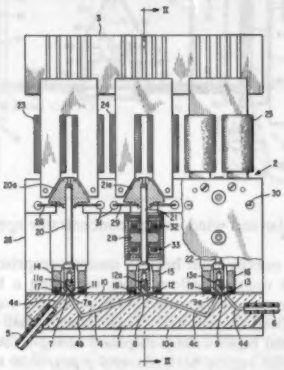
1. An adjustable pitch marine propeller comprising a hub and a plurality of blades removably mounted in said hub, each of said blades having a mounting root, said hub comprising forward and aft sections, said forward section having a plurality of recesses formed in an aft-facing surface thereof for at least partially receiving said blade roots such that each of said blades is removable from said recesses by axial displacement along an axis at least generally parallel to the longitudinal axis of said hub and is adjustable about its root axis so as to permit pitch adjustment, said aft hub section comprising a plurality of clamping segments formed with recesses therein to cooperate with said recesses in said forward section to form root housings for receiving and frictionally clamping the blade roots when the clamping segments are mounted on said forward hub section, such that pitch-changing rotation of said blade is selectively prevented or permitted by relatively increasing or decreasing the clamping friction between a blade root and its root housing without necessitating rearward movement of the blade, and means for removably mounting and connecting each segment independently on said forward hub section adjacent said aft-facing surface such that the clamping segment recesses mate with the recesses in said forward hub section, and such that each segment is removable or loosenable independently of the other segments such that one blade can be adjusted or removed without affecting the frictional clamping of the blade root of any other blade.

4,150,922

ELECTROMAGNET MOTOR CONTROL FOR CONSTANT VOLUME PUMPING

Gérard Cuénoud, Grand-Lancy; Rudolf Farkas, Geneva; Georges Revillet, Onex, and Manuel Sanz, Grand-Lancy, all of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 23, 1976, Ser. No. 698,998
Claims priority, application Switzerland, Jun. 27, 1975, 8361/75
Int. Cl.[2] F04B *49/06, 17/04, 35/04;* F16J *1/10*
U.S. Cl. 417—45 **6 Claims**



1. A pipetting device for pipetting increments of constant volume comprising:

(a) pumping means including a duct connected at its end to one of a pair of access ports of a first valve and of a second valve, at least a portion of the duct wall being movable so that a variable-volume pipetting chamber is provided, the second access port of the valves being in the case of one valve the intake port for liquid to be pipetted by the device and in the case of the other valve the delivery port for pipetted liquid;

(b) three drive elements affixed to the pumping means along respective paths determined by guide means and connected one each to the valves, to the movable portion of the duct wall, and to retention means; and

(c) means for sequentially determining the displacement of the drive elements in opposition to the retention means, the means for determining the displacement of the drive element connected to the movable portion of the duct wall of the pumping means comprising:

(1) an electromagnet energizable by an electrical current to act upon an armature operatively connected to the drive element to transmit to it a reciprocating motion along its path;

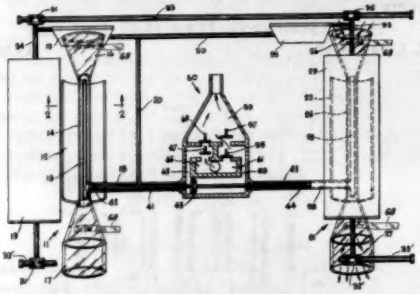
(2) a movement detector having a mobile part affixed to a rod which connects the armature to the movable portion of the duct wall, the detector producing a signal corresponding to the position of the rod; and

(3) a controller adapted to provide, in dependence upon the difference between such signal produced by the detector and a reference signal, a command signal for so controlling the magnitude of an electrical current supplied for energizing the electromagnet that the armature is gradually and continuously displaced between first and second predetermined positions, whereby a displacement of the duct wall is effected which is characteristic of the volume desired for the pipetted increment.

4,150,923
RECIPROCATING PUMP POWERED BY SOLAR AND WIND ENERGY

John C. Wardman, 1060 San Tomas Aquino Rd., Campbell, Calif. 95008

Filed Apr. 20, 1978, Ser. No. 898,299
Int. Cl.[2] F04B 17/00; F03G 7/02, 7/06
U.S. Cl. 417—379 11 Claims



1. A solar and wind energy concentrator apparatus comprising,

a solar energy fluid heating means comprising two substantially coaxial hollow pipes including a heat conductive inner pipe being sealed and confining a vaporizable working fluid therein and a light transparent outer pipe, said coaxial pipes axially disposed along a focal line with an annular region between said pipes, solar energy focusing means proximate to said coaxial pipes for accepting and focusing sun rays onto a focal line where said coaxial pipes are disposed, and air intake means in communication with said annular region for directing wind into the annular region,

an interconnecting pipe, in communication with the interior of inner heat conducting pipe for directing fluid from the inner pipe to a differential pressure utilization means,

pump means connected to said interconnecting pipe for converting pressure changes in said fluid into useful work,

a sun shield means for alternately shielding and uncovering said solar energy fluid heating means with respect to direct solar radiation, and

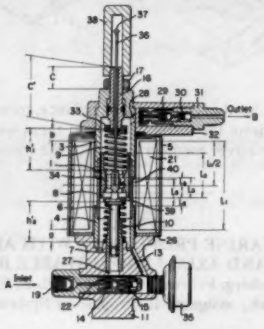
a wind shield means for alternately interrupting and permitting wind flow into the annular region between pipes whereby said sun shield means and wind shield means are operable to create pressure changes in said working fluid.

4,150,924
ELECTROMAGNETIC PLUNGER PUMP

Akira Toyoda, Tokyo, Japan, assignor to Taisan Industrial Co., Ltd., Japan

Filed Dec. 5, 1977, Ser. No. 857,308
Claims priority, application Japan, Jun. 10, 1977, 52/67854
Int. Cl.[2] F04B 49/00
U.S. Cl. 417—417 4 Claims

1. In an electromagnetic plunger pump, particularly using a half-wave rectified current as a power source, comprising an electromagnetic coil, a plunger case mounted along the center axis of the winding on said electromagnetic coil, an annular magnetic path and an annular magnetic pole located at opposite ends of the center axis of the winding on the electromagnetic coil and arranged in spaced juxtaposed relation so as to form a magnetic flux leaking portion therebetween, an electromagnetic plunger fitted in said plunger case for sliding reciprocatory movement along the center axis thereof having one end portion received in said annular magnetic path at all times during operation and shutdown of the pump, and a delivery plunger arranged coaxially with and adjacent to the electromagnetic plunger, said electromagnetic plunger and said delivery plunger being balanced and maintained in pressing engagement with each other in the vicinity of the magnetic flux leading portion by the biasing forces of an auxiliary spring and a restoring spring, the improvement wherein said electromagnetic plunger and said delivery plunger cooperating with the electromagnetic plunger are balanced and maintained in pressing engagement with each other by the biasing forces of the auxiliary spring and the restoring spring in such a manner that when the electromagnetic plunger is moved toward the annular magnetic pole to increase the sum of the deflections of the two springs so that the distance lb between the center of the winding or the magnetically neutral point of the electromag-

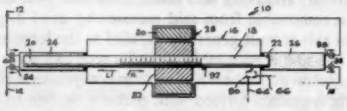


netic coil and the magnetically neutral point of the electromagnetic plunger along the center axis thereof and the distance la between the end of the annular magnetic pole which is disposed anteriorly of the electromagnetic plunger with respect to the operating direction of the latter when the electromagnetic coil is energized and the end of the annular magnetic pole disposed in spaced juxtaposed relation to the electromagnetic plunger may have a relation $0.1 < la/lb < 1$, the pump has a characteristic that its delivery pressure is reduced when the sum of the deflections of the two spring increases, whereby the delivery pressure of the pump can be stabilized in spite of a variation in the value of the pressure applied thereto.

4,150,925
FAST ACTING CHECK VALVE

Gerald S. Perkins, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 2, 1977, Ser. No. 830,212
Int. Cl.[2] F04B 17/04
U.S. Cl. 417—418 8 Claims



1. A check valve which minimizes regurgitant flow, comprising:

a housing forming a fluid path and having walls forming a valve seat;

a valve member moveable in an up-path direction against said valve seat and in a downpath direction away from said valve seat;

an energizable actuator coupled to said valve member to apply a large force urging said valve member toward said valve seat; and

means responsive to at least the eminent termination of downpath fluid flow past said valve seat, for energizing said actuator so it applies a large force to said valve member that urges it towards said valve seat, and for then

ceasing the energization of said actuator so it ceases the application of said large force to said valve member to allow the valve member to be easily moved away from the valve seat.

4,150,926

ROTARY PISTON COMPRESSOR WITH TRANSFER FLOW POCKETS IN HOUSING

Dankwart Eiermann, Lindau, Fed. Rep. of Germany, assignor to Borsig GmbH and Wankel GmbH, both of Berlin, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 867,771

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1977, 2700731

Int. Cl.[2] F04C *17/02, 29/00*

U.S. Cl. 418—61 A 4 Claims

1. A rotary piston compressor which includes: a housing having two side portions each one of which is provided with transfer flow pockets, said housing also having an intermediate portion arranged between said side portions and having its inner surface designed as a double-arcuate trochoidal raceway, an eccentric shaft rotatably journalled in said compressor, a triangular piston rotatably mounted on said eccentric shaft and having its corners in continuous sliding contact with said raceway, said piston having its lateral rim portions provided with sealing strips while with said side portions and said intermediate portion forming working chambers and compression chambers, inlet and outlet ports in said housing for said chambers, said transfer flow pockets extending radially inwardly to such an extent only as not to be swept by said sealing strips, when looking in the direction of rotation of said piston the front control edge of said transfer flow pockets being determined by the location of the leading piston corner of that chamber which occupies its dead center position whereas the rear control edge of said transfer flow pockets is determined by the location of said same leading corner at the time of uncovering the inlet port toward the preceding chamber.

4,150,927

MOLD FOR THE PRODUCTION OF ANISOTROPIC PERMANENT MAGNETS

Erich A. Steingroever, Bonn, Fed. Rep. of Germany, assignor to Magnetfabrik Bonn, GmbH vormals Gewerkschaft Windhorst, Bonn, Fed. Rep. of Germany

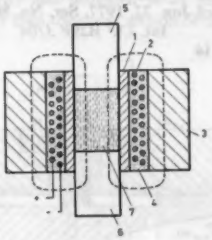
Filed Apr. 4, 1977, Ser. No. 784,649

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2629990

Int. Cl.[2] B22F *3/00;* B30B *11/04*

U.S. Cl. 425—3 17 Claims

1. A mold for use with at least one reciprocatory ram for the production of anisotropic permanent magnets from permanent magnet powder under the influence of a magnetic field, said mold having a cavity to receive said ram for compacting said particles within said cavity under pressure, said cavity being defined by tubular relatively thin-walled lining, a radially incompressible electrical field coil means closely surrounding said lining, and means for reinforcing said field coil means and



said lining against excessive radially outwardly directed forces generated within said cavity.

4,150,928

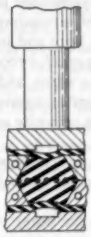
APPARATUS FOR MAKING DOUBLE ANGLE V-BELT

Joseph P. Regan, and James R. Thomas, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jul. 21, 1978, Ser. No. 926,982

Int. Cl.[2] B29C *17/00;* B29D *29/00;* B29H *7/22*

U.S. Cl. 425—40 4 Claims



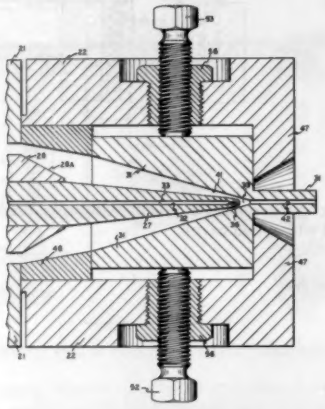
1. A mold for simultaneously molding and curing at least a portion of an endless belt made primarily of elastomeric material and having a double truncated V cross-section, which comprises a first mold section and a mating second mold section, each of said mold sections comprising a first flat member having a first planar surface and a second planar surface, said second planar surface having an elongated recessed portion therein; a second flat member having a first planar surface and a second planar surface, said second flat member being resilient and said first planar surface of said second flat member being in contact with said first flat member; at least two cavity forming members, each having a first parallel face, a second parallel face and at least one inclined face, said first parallel faces being in contact with said second planar surface of said second flat member; and means for assembling said first flat member, said second flat member and said cavity forming members; wherein, when assembled together, said cavity forming members and said resilient second flat member cooperate to form an elongated mold cavity having a trapezoidal cross-section wherein the base of said trapezoidal cavity opens outwardly toward the opposite mating mold section, and wherein said recessed portion in said first flat member is located below said resilient second flat member at the apex of said cavity.

4,150,929

RIBBON CABLE EXTRUSION APPARATUS

Adolf W. Brandt, Stratford, Conn., assignor to B & H Tool Company, Inc., Bridgeport, Conn.

Filed Jun. 22, 1977, Ser. No. 808,979
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—114 9 Claims



1. A ribbon cable extrusion die assembly for encapsulating an arrayed plurality of fine conductor wires with plastic insulation, comprising:

(A) a hollow housing enclosing a longitudinal bore having
  (a) a width substantially exceeding its height,
  (b) an entrance end, and
  (c) an extrusion end opposite the entrance end;

(B) a low flat hollow core tube having a width substantially exceeding its height, extending from the entrance end of the bore inside the bore and incorporating
  (a) a wire receiving end for receiving the arrayed plurality of fine conductor wires, and
  (b) wire delivery portal means
    (1) formed at the opposite end from the wire receiving end,
    (2) dimensioned to accommodate the arrayed plurality of fine conductor wires led through the core tube, and
    (3) opening into the bore,

(C) plastic delivery means incorporating
  (a) a plastic inlet portal communicating with the bore, and
  (b) a plastic guiding cavity formed between the bore and the core tube and positioned to deliver flowing molten plastic insulating material from the inlet portal to the extrusion end of the bore,

(D) an extrusion die
  (a) positioned inside the extrusion end of the bore in close juxtaposition with the core tube, and
  (b) having extrusion passage means dimensioned to accommodate the arrayed plurality of fine conductor wires, and

(E) a plurality of removeable elongated quill tubes laterally arrayed side by side across the interior of the core tube and extending substantially the entire length thereof, with each of said quill tubes
  (a) encircling one of the fine conductor wires and guiding the wire from the wire-receiving end of the core tube to the wire delivery portal means of the core tube, and
  (b) installed through the wire-receiving end of the core tube for rapid removal from the core tube for replacement of a broken wire,

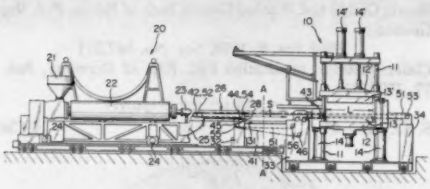
whereby each of the fine conductor wires entering the core tube is easily replaced when broken merely by removing its quill tube and replacing the quill tube with the wire contained therein.

4,150,930

PLASTIC SHEET EXTRUDER COMBINED WITH FORMING MACHINE

Kazuo Asano, Nagoya, Japan, assignor to Kabushiki Kaisha Asano Kenkyusho, Nagoya, Japan

Filed Dec. 19, 1977, Ser. No. 861,949
Claims priority, application Japan, Dec. 31, 1976, 51/157943
Int. Cl.[2] B29C *3/06;* B29D *7/02*
U.S. Cl. 425—145 10 Claims



1. In a plastic extruding and forming apparatus having an extruder operative to continuously extrude plastic material at a predetermined rate and a forming apparatus operative to discontinuously alternately receive and form said plastic material and means for conveying said plastic material between said extruder and saif forming apparatus, the improvement comprising:

(a) means for moving said extruder toward and away from said forming apparatus;

(b) said means for moving being operative to move said extruder away from said forming apparatus at a rate equal to said predetermined rate of extrusion;

(c) said means for conveying being extendably disposed between said extruder and said forming apparatus;

(d) drive means for driving said means for conveying;

(e) said drive means being operative to brake the end of said means for conveying nearest said forming apparatus during the motion of said extruder away from said forming apparatus and is further operative to move said means for conveying during the motion of said extruder toward said forming apparatus, said last named motion being at a rate which maintains a speed of said conveying means with respect to said extruder equal to the rate of extrusion; and

(f) means for synchronizing the motion of said extruder away from said forming apparatus with forming said plastic material, and for synchronizing the motion of said extruder toward said forming apparatus with feeding said plastic material.

4,150,931

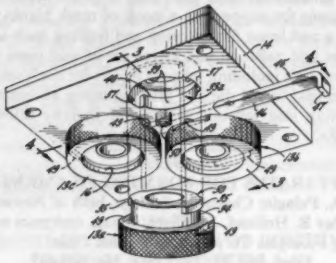
INJECTION MOLDING APPARATUS WITH QUICK CHANGE MOLDS

Kenneth F. Gabrys, Streamwood, Ill., assignor to The Pentaject Corporation, Algonquin, Ill.

Filed Oct. 3, 1977, Ser. No. 838,645
Int. Cl.[2] B29C *1/16*
U.S. Cl. 425—186 9 Claims

1. Molding apparatus comprising a plate member, a mold member, a socket, and a coupling, said socket being located in one of said members, said coupling being located on the other of said members, said socket being sized and shaped to telescopically receive said coupling when said mold member is in an unlocked position and to interlock with said coupling when said mold member is turned to a locked position, a second mold member, a second socket similar to said one socket, and a second coupling similar to said one coupling, said second socket being sized and shaped to telescopically receive said second coupling when said second mold member is in an unlocked position and to interlock with said second coupling when said second mold member is turned to an unlocked position, first and second recesses formed in said first and second mold members, respectively, and defining a channel

when said mold members are in their locked positions, and a selectively releasable elongated key inserted into said channel



and operable to prevent both of said mold members from turning from their locked positions to their unlocked positions.

4,150,932

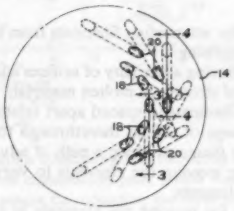
EXTRUDER STRAINER PLATE

Sharad R. Moghe, Northfield Center, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 18, 1977, Ser. No. 788,220

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—197 **7 Claims**



1. A strainer plate for an extruder for providing a balanced flow, said strainer plate comprising a plate member having a first set of apertures extending therethrough, said first set of apertures being located equidistant from the center of said plate member, said plate member having a second set of apertures extending therethrough, said second set of apertures being located equidistant from the center of said plate member but at a distance greater than said first set of apertures, said apertures of said first set extending through said plate member in a helical direction, and said apertures of said second set extending through said plate member in a helical direction opposite to said first set of apertures.

4,150,933

APPARATUS FOR MOLDING ROOFING PANELS HAVING A STEPPED PORTION

Naomichi Yano; Kazuhiro Shinohara, and Joe Sato, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Feb. 2, 1978, Ser. No. 874,648

Claims priority, application Japan, Feb. 2, 1977, 52-11088; Feb. 2, 1977, 52-11089; Feb. 2, 1977, 52-11090

Int. Cl.[2] B28B *1/29, 3/00*

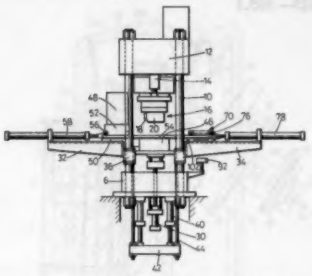
U.S. Cl. 425—219 **7 Claims**

1. In an apparatus for molding roofing panels having a stepped portion by placing a roofing panel material into the cavity of a lower die and lowering an upper die into the lower die to compress the material, the improvement comprising:

a lower die having cavities conforming to the outside contours of the roofing panel including a main body and an offset insert portion, the lower die being divided into a die segment for forming the main body and a die segment for forming the insert portion at a portion of the cavity for forming the insert portion,

drive means for supporting the main body die segment to raise and lower the main body die segment,

a horizontally supported hopper movable into and out of the lower die cavity and provided at its front end with a scraper smaller than the cross section of the cavity of the



insert portion die segment by the thickness of the material to be accumulated therein, and

an upper die vertically movably disposed above the lower die and having a molding face conforming to the shape of the inside face of the roofing panel.

4,150,934

APPARATUS FOR THE CHIP-FREE MANUFACTURE OF AXIALLY SYMMETRICAL SOLID BODIES OF VARIOUS DIAMETERS ALONG THEIR LONGITUDINAL EXTENSION, MADE OF A SOFT RESILIENT PLASTICS MATERIAL

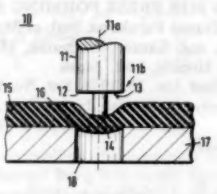
Gerhard Bobertag, Hamburg; Bernfried Dihse, Norderstedt; Claus D. Harms, Hamburg; Uwe Gatzemann, Hamburg, and Wilhelm Harms, Hamburg, all of Fed. Rep. of Germany, assignors to Bobertag und Häusler GmbH, Norderstedt and Gehörschutzcenter Wilhelm und Claus-Dieter Harms GmbH, Hamburg, both of, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 861,019

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656939

Int. Cl.[2] B24C *17/00*

U.S. Cl. 425—305.1 **12 Claims**



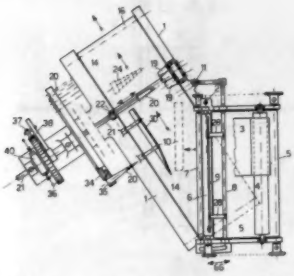
1. An apparatus for the chip-free manufacturing of axially symmetrical solid bodies of various diameters along their longitudinal extension, made of a soft resilient plastics foam material, in employing cutting tools for punch-pressing a portion of a plate of soft resilient foam material compressing in the cutting region by a die, said apparatus being characterized by means arranged at a face (13) of a die portion associated with an aperture (18) in a cutting plate (17), said means being disposed coaxially of the center axis of said die and adapted to be operatively coupled with an end portion cooperating with said die (11) of said aperture (18) in said cutting plate (17) to pre-stress a foam material blank intended to be severed.

4,150,935

APPARATUS FOR AUTOMATICALLY CUTTING, ROLLING AND DAMPENING PASTRY ROLLS

Dario Venzo, Via Camin 18, Schio (Vicenza), Italy

Filed Jul. 26, 1976, Ser. No. 708,879
Int. Cl.[2] A21C 9/08, 11/10, 11/22
U.S. Cl. 425—305.1 9 Claims



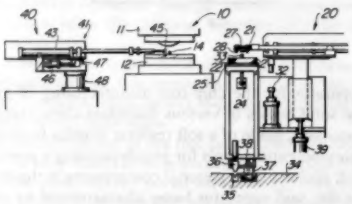
1. An apparatus for automatically cutting and rolling cannoli from rolls of laminated dough which comprises a frame supporting a first conveyor belt, means for feeding said rolls of laminated dough on one side of the frame, means for cutting the rolls of laminated dough into strips supported by said frame, means for feeding said strips onto said first conveyor belt in a diagonal direction thereto, means for adjusting the inclination of said strips with respect to said conveyor belt, means for winding said strips in cylindrical cannoli, adjacent said means for feeding said strips, said first conveyor belt travelling on two first rollers located about the middle thereof and being supported by two additional terminal rollers whereby said conveyor belt travels on two different planes, the means for winding said strips which comprises three rollers located above said first two rollers and close one to the other and a rotating shaft which carries a metallic tube in the shape of a cannolo adapted to be inserted among said rollers, means for locating each strip of dough on said metallic tube and for guiding said strip of dough under said three rollers and for closing the extremity of said cannoli which comprise four rollers whereby the strip of dough is wound on said metallic tube by the action of said four rollers and means for detaching said strips after they have been wound.

4,150,936

APPARATUS FOR PRESS FORMING SHADOW MASKS

Hideji Shioi; Tsuneo Furukawa, both of Mobara; Hiroaki Kouchi, Akashi, and Kazuo Nishimatsu, Himeji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 25, 1978, Ser. No. 900,004
Claims priority, application Japan, Oct. 26, 1977, 52-127533
Int. Cl.[2] B29C 7/00, 17/00
U.S. Cl. 425—397 8 Claims



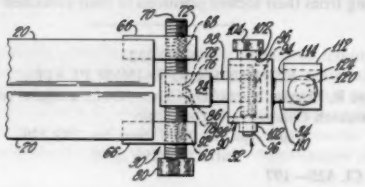
1. An apparatus for press forming shadow masks, comprising a press unit which includes a set of upper and lower forming dies for mask blanks, a feeder unit for automatically feeding said blanks, one by one, to the lower die of said press unit, and a takeout unit for automatically taking out the formed masks from said press unit, said lower die of said press unit having locator means for locating each said mask blank for press forming, said feeder unit including a pallet equipped with locator means for supporting a stack of mask blanks and also including a pad beam for carrying and feeding each said mask blank from said pallet to said lower die of said press unit, and said takeout unit including takeout means for each said formed mask from said lower die and also including reversing means for reversing said takeout means and thereby allowing the same to place said mask on a conveyor.

4,150,937

APPARATUS FOR FORMING FILAMENTS

Gregory A. Pelagio; Charles J. Stalego, both of Newark, Ohio, and Wiley B. Holland, Attelboro, Mass., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 23, 1977, Ser. No. 809,487
Int. Cl.[2] B29C 25/00; B29F 3/00
U.S. Cl. 425—464 7 Claims



1. Apparatus for attenuating filaments from streams of molten material comprising:

feeder means having a plurality of orifices adapted to supply a plurality of streams of molten material;

a plurality of elements in spaced apart relationship adapted for the passage of a fluid therethrough to attenuate said streams into filaments along a path of advancement;

first means for moving the elements to vary the space between the elements;

second means for moving the elements in a direction substantially transverse to the path of said filaments being attenuated, the second means being connected to the first means; and

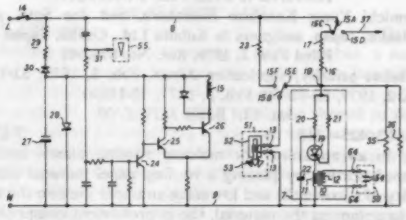
third means for moving the elements in a direction substantially along the path of the filaments being attenuated, the third means being connected to the second means.

4,150,938

CONTROL UNIT FOR A GAS BURNER

Edward J. Renshaw, Castle Douglas, and Michael J. Blissett, Dalbeatie, both of Scotland, assignors to Steel Radiators Limited, Henley-on-Thames, England

Filed Mar. 25, 1977, Ser. No. 781,312
Claims priority, application United Kingdom, Apr. 6, 1976, 13939/76
Int. Cl.[2] F23N 5/20
U.S. Cl. 431—67 12 Claims



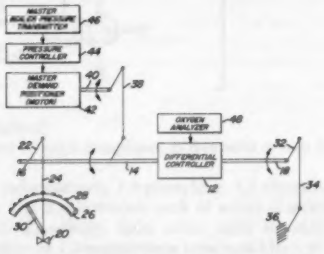
1. A control system for a gas burner, which comprises a normally closed valve for controlling the gas supply to the burner, and an electric solenoid connected to the valve, the solenoid being arranged for actuating the valve to its open condition when energized with a current of at least a first

predetermined value, but capable of holding the valve open when energised with a current of at least a second predetermined value lower than the first, the system further including an electric circuit for energizing the solenoid from an electric supply and including solid-state variable impedance means connected in circuit relation to the solenoid and arranged, on operation of the solenoid to open the valve, for controlling the solenoid current to decrease progressively from the first said predetermined value to below the second said predetermined value over a time period of substantial length, unless during said time period the burner is successfully ignited in which case the electric circuit is arranged to maintain the solenoid current at at least the second said predetermined value.

4,150,939
DIFFERENTIAL CONTROLLER FOR POSITIONING COMBUSTION SYSTEM

William H. Hayes, Paramus, N.J., assignor to Reliance Instrument Manufacturing Corp., Lodi, N.J.

Filed Aug. 22, 1977, Ser. No. 826,294
Int. Cl.[2] F23N *5/00*
U.S. Cl. 431—76 **18 Claims**



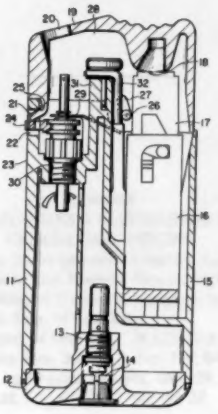
1. In a combustion control system including a stack through which products of combustion pass, a first rotating shaft portion coupled to means for adjusting the flow of fuel through a fuel valve and a second rotating shaft portion coupled to means for adjusting the flow of air through a damper, said first and second shaft portions being arranged to rotate together from a low fire position to a high fire position to establish the fuel and air flows from all positions therebetween, a differential controller providing relative vernier rotation between said first and second shaft portions to enable said fuel to be burned efficiently irrespective of changes in the fuel or air provided, said differential controller comprising means for comparing the oxygen level in the stack with a preselected oxygen level and for effecting the vernier rotation of said second shaft portion with respect to said first shaft portion when there is a deviation from said preselected oxygen level to adjust the oxygen level to said preselected level, means for adjusting the gain of said differential controller to enable greater vernier rotation as the first shaft portion is rotated from the low fire position to higher fire positions and override means to cause said second shaft portion to assume a predetermined null position with respect to said first shaft portion in response to an alarm condition.

4,150,940
CIGARETTE LIGHTER

Heinz Heller, Rodenkirchen; Winfried Brand, Troisdorf, and Peter Gogovic, Leverkusen, all of Fed. Rep. of Germany, assignors to Ronson Gesellschaft mit beschränkter Haftung, Cologne, Fed. Rep. of Germany

Filed Aug. 24, 1977, Ser. No. 827,379
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2639242
Int. Cl.[2] F23Q *2/08*
U.S. Cl. 431—130 **6 Claims**

1. A cigarette lighter of the kind having a housing on one end of which is mounted a cap-type member for actuating the ignition mechanism wherein the front wall of the housing is formed with an opening and the front end of the actuating member is formed with a lug which extends into the opening

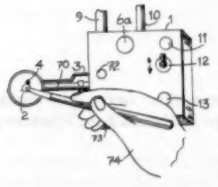


and engages the outer edge thereof, this edge forming a fulcrum about which the actuating member pivots and said opening is an opening provided for the setting arm of the flame height adjusting mechanism of a burner valve.

4,150,941
PHOTOELECTRIC CONTROL DEVICE FOR GAS BURNERS

Friederich Obermeier, Niefern, Fed. Rep. of Germany, assignor to Firma Dr. Th. Wieland, Pforzheim, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,574
Int. Cl.[2] F23D *13/40*
U.S. Cl. 431-355 **11 Claims**



1. Apparatus for controlling the operation of a fluid fuel burner wherein the burner has a fuel supply line with a valve disposed therein, the operation of which is photoelectrically controlled to open when light incidence upon the apparatus is reduced and to close when light incidence upon the apparatus is increased, the apparatus comprising:

first and second photoelectric means for sensing incident light, said photoelectric means positioned for receiving light incident on distinct, spaced apart portions of said apparatus;

comparator means connected to the photoelectric means for comparing outputs of the photoelectric means to one another to provide a triggering signal on an output thereof when the outputs of the photoelectric means are not balanced; and

switch means connected between the comparator means and the valve for actuating the valve to open in response to the triggering signal.

4,150,942
1:2 METAL COMPLEXES OF AZO COMPOUNDS HAVING 1-HYDROXYNAPHTHALENE-3-SULFONIC ACID COUPLING COMPONENT RADICALS AT LEAST ONE OF WHICH IS A DISAZO COMPOUND

Herbert Holliger, Allschwil, and Heinz Wicki, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

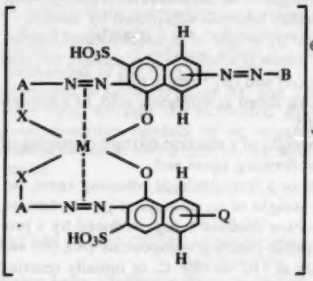
Filed May 27, 1977, Ser. No. 801,397

Claims priority, application Switzerland, May 31, 1976, 6812/76

Int. Cl.[2] C09B *45/26, 45/30, 45/32;* D06P *3/32*

U.S. Cl. 8—26 **37 Claims**

1. A complex of the formula



or a salt thereof,

or a mixture of such complexes in free acid or salt form,

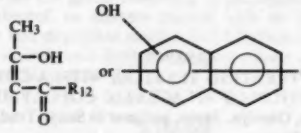
wherein

each A is independently 1,2-phenylene; 1,2-phenylene substituted by 1 or 2 substituents each of which is independently C_{1-4}alkyl, C_{1-4}alkoxy, halo, nitro, sulfo or carboxy; 1,2-naphthylene or 1,2-naphthylene substituted by 1 or 2 substituents each of which is independently C_{1-4}alkyl, C_{1-4}alkoxy, halo, nitro, sulfo or carboxy,

Q is —N=N—B, formamido or (C_{1-4}alkyl)carbonylamino,

each X is independently —O— or —COO—,

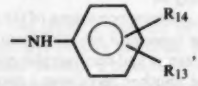
each B is independently a coupling component radical selected from substituted phenyl each substituent of which is independently hydroxy, $-NR_1R_2$, C_{1-4}alkyl, C_{1-4}alkoxy, halo, acetamido or sulfo, with the proviso that at least one substituent is hydroxy or $-NR_1R_2$;



wherein R_1 is hydrogen, C_{1-6}alkyl or C_{2-4}hydroxyalkyl,

R_2 is hydrogen, C_{1-6}alkyl, phenyl, (C_{1-6}alkyl)phenyl or C_{2-4}hydroxyalkyl,

R_{12} is C_{1-4}alkyl, C_{1-4}alkoxy or



wherein R_{13} is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, chloro or sulfo, and

R_{14} is hydrogen, chloro or C_{2-4}alkyl, and

n is 0, 1 or 2, with the proviso that when Q is formamido or (C_{1-4}alkyl)carbonylamino, B is substituted phenyl each substituent of which is independently hydroxy, $-NR_1R_2$, C_{1-4}alkyl, C_{1-4}alkoxy, halo, acetamido or sulfo, with the proviso that at least one substituent is hydroxy or $-NR_1R_2$,

M is a metal forming 1:2 metal complexes, and

$Y^{\oplus}$ is hydrogen or a non-chromophoric cation.

4,150,943
UNIFORMLY DYED WATER-SWELLABLE CELLULOSIC FIBERS

Johannes Dehnert, Ludwigshafen; Günther Lamm, Hassloch; Werner Juenemann, and Guenter Meyer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

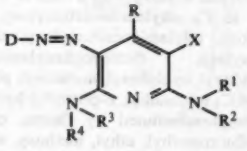
Continuation-in-part of Ser. No. 728,527, Oct. 1, 1976. This application Oct. 31, 1977, Ser. No. 846,720

Claims priority, application Austria, Oct. 29, 1975, 8223/75

Int. Cl.[2] C09B *27/00, 29/22*

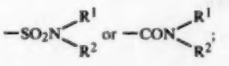
U.S. Cl. 8—41 R **11 Claims**

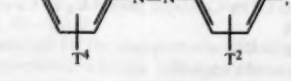
1. Uniformly dyed water-swellable cellulosic fibers, said fibers being fast to washing, dry cleaning, sublimation and light and having been produced by contacting water-swellable cellulose fibers subsequently or concomitantly with water, ethylene glycol or a derivative thereof and, while the fibers are still swollen, an essentially water-insoluble dye of the formula



in which

D is phenyl substituted by cyano, trifluoromethyl, methyl, fluoro, chloro, bromo, C_1 to C_4 alkylsulfonyl, phenylsulfonyl,





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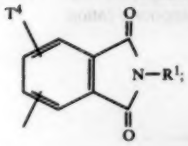
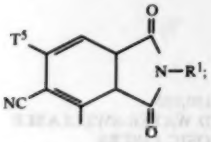




anthraquinonyl; anthraquinonyl substituted by methyl, chloro, bromo or carboxyl; or benzoisothiazolyl substituted by nitro, chloro or bromo;

R is hydrogen, C_1 to C_3 alkyl or phenyl;

X is cyano, carbamoyl or

R^1 and R^3 independently of one another are hydrogen; C_1 to C_8 alkyl;

C_2 to C_8 alkyl substituted by hydroxy, C_1 to C_8 alkoxy, phenoxy, tolyloxy, cyclohexyloxy, benzyloxy, β-phenylethoxy, carboxyl, carboxylic ester with a total of 2 to 9 carbon atoms, carboxylic acyloxy with a total of 1 to 11 carbon atoms, C_1 to C_8 alkylaminocarbonyloxy, benzoylaminocarbonyloxy, tolylaminocarbonyloxy, chlorophenylaminocarbonyloxy, dichlorophenylaminocarbonyloxy or pyrrolidonyl; cyclohexyl, norbornyl; phenyl-C_1 to C_4-alkyl; tolyl-C_1 to C_4-alkyl; β-phenyl-β-hydroxyethyl; phenyl; phenyl substituted by fluoro, chloro, bromo, methyl, trifluoromethyl, ethyl, methoxy, ethoxy or pyrrolidonyl; $CH_2CH_2OCH_2CH_2OH$; or $(CH_2)_3(OC_2H_4)_nOB$;

n is zero, 1 or 2;

B is hydrogen, C_1 to C_4 alkyl, cyclohexyl, benzyl, phenylethyl, phenyl or tolyl;

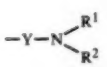
R^2 and R^4 independently of one another are hydrogen or C_1 to C_4 alkyl;

R^1 to R^2 together with the nitrogen are pyrrolidino, piperidino, morpholino or hexamethyleneimino;

T^1 is hydrogen, chloro, bromo or methyl;

T^2 is hydrogen or methyl;

T^3 is hydrogen,



or $COOB^1$;

B^1 is hydrogen, C_1 to C_8 alkyl, phenyl-C_1 to C_4-alkyl or $(OC_2H_4)_nOB$;

Y is $-SO_2-$ or $-CO-$;

T^4 is hydrogen or chloro; and

T^5 is hydrogen, methyl or ethyl.

4,150,944

SULPHONATED, AROMATIC REACTION PRODUCTS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE AS SUBSTANCES HAVING A TANNING ACTION

Albert Würmli, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,161

Claims priority, application Switzerland, Apr. 22, 1976, 5046/76

Int. Cl.[2] C08G *75/20, 75/24;* C14C *3/20*

U.S. Cl. 94.24 **16 Claims**

1. A sulphonated, aromatic reaction product of

(1) 100 parts by weight of a sulphonation product of (A) 10 to 90 percent by weight of an unsubstituted diphenyl ether or of a diphenyl ether which is substituted by methyl,

(B) 90 to 10 percent by weight of an unsubstituted phenol, or of a phenol which is substituted by methyl, the sum of components (A) and (B) being 1 mol. and

(C) 1 to 2 mols, calculated as sulphonic acid, of a sulphonating agent and

(2) 4 to 24 parts by weight of a reaction mixture consisting of

(D) an aminoplast-forming agent and

(E) formaldehyde or a formaldehyde releasing agent, or

(3) 4 to 24 parts by weight of an aminoplast precondensate, said aromatic reaction product being produced by a process, which comprises reacting components (A), (B) and (C) simultaneously at 110° to 180° C. or initially reacting component (A) with component (C) at 110° to 120° C. and then with component (B) at 110° to 180° C. or initially reacting component (B) with component (C) at 110° to 120° C. and then with component (A) at 110° to 180° C. to give the sulphonation product (1), further reacting said sulphonation product (1) at a temperature from 60° to 95° C. with components (2) or (3) to give a reaction product, then adding an organic or inorganic base to said reaction product and finally optionally adding an organic acid to said reaction product.

4,150,945

METHOD OF TREATING TEXTILES WITH A CURABLE COMPOSITION OF AN ACRYLIC COPOLYMER

Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Division of Ser. No. 786,673, Apr. 11, 1977, Pat. No. 4,069,214. This application Oct. 7, 1977, Ser. No. 840,480

Claims priority, application Japan, Apr. 16, 1976, 51-42332

Int. Cl.[2] C08F *8/32*

U.S. Cl. 8—115.6 **6 Claims**

1. A method of finishing textiles which comprises contacting the textile with an aqueous emulsion of a curable composition consisting essentially of

(a) an acrylic copolymer consisting of (1) a major proportion of at least one monomer selected from the group consisting of acrylic esters and methacrylic esters and (2) a minor proportion of another monomer copolymerizable therewith, and

(b) at least one curing agent selected from the group consisting of lysine, ornithine, arginine, glutamine, asparagine, citrulline, cystine, hydroxylysine, and salts of these amino acids and then curing the curable composition on the thus-treated textile at elevated temperatures.

4,150,946

WATER-SOLUBLE POLYURETHANES AND COMPOSITIONS AND APPLICATION THEREOF TO SUBSTRATES

Jean Neel, and Robert Violland, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 770,657, Feb. 22, 1977, abandoned, which is a continuation of Ser. No. 628,657, Nov. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,151, Oct. 11, 1974, Pat. No. 4,110,284. This application Nov. 8, 1977, Ser. No. 849,602

Int. Cl.[2] **D06M** *15/12;* **C08G** *18/46;* **C08J** *3/02;* **B32B** *27/40*

U.S. Cl. 8—115.6 **55 Claims**

35. A film-forming, directly water-soluble, anionic polyester-polyurethane comprising recurring units of the formula —A—B—, wherein A is a sulfonated anionic polyester having a sulfur content of between about 0.8 and 2% by weight, an acid number of less than about 200 mg KOH/g, and a molecular weight of between about 500 and 3,000, and B is a diurethane unit, wherein the sulfonated anionic polyester is the co-condensation product of an organic diacid, an organic sulfonated diacid and a diol, or the ester-forming derivatives thereof.

4,150,947

STABLE, CONCENTRATED DISPERSIONS OF BASIC DYESTUFFS

Walter Lang, Pfeffingen; Rémy Jeanneret, Allschwil, and Anton Kaiser, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 548,046, Feb. 7, 1975, abandoned, which is a continuation of Ser. No. 427,890, Dec. 26, 1973, abandoned, which is a continuation of Ser. No. 205,722, Dec. 7, 1971, abandoned, which is a continuation of Ser. No. 800,776, Feb. 19, 1969, abandoned. This application Jun. 11, 1976, Ser. No. 694,874

Claims priority, application Switzerland, Mar. 1, 1968, 3084/68

Int. Cl.[2] **D06P** *1/64*

U.S. Cl. 8—93 **13 Claims**

1. A stable, liquid, concentrated dyeing composition, consisting essentially of from 10% to 80% of at least one water-soluble basic dyestuff which is substantially free of inorganic salts, having a mean particle size of 0.1 to about 20 microns, dispersed in from 90% to 20% of an organic dispersion medium in which the dyestuff is insoluble, said dispersion medium consisting essentially of a water-soluble, liquid, organic solvent selected from the group consisting of polyhydric alcohols and ethers thereof, or mixture thereof with up to 20% water, wherein said dispersion medium has a boiling point above 80° C., and wherein said dyeing composition has a viscosity of 100 to about 250 cp at 20° C.

4,150,948

METHOD FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, St. Laurent, and William J. McLay, Montreal, both of Canada, assignors to Knit-Fin Machinery Ltd., Montreal, Canada

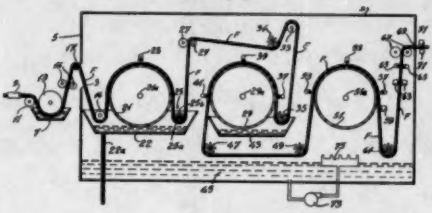
Division of Ser. No. 754,951, Dec. 28, 1976, Pat. No. 4,068,501. This application Nov. 30, 1977, Ser. No. 856,137

Claims priority, application Canada, Oct. 25, 1976, 264255

Int. Cl.[2] **D06B** *1/08*

U.S. Cl. 8—151 **2 Claims**

1. A method for the liquid treatment of a tubular fabric, including the steps of: (A) passing the fabric in a flat condition defining opposite sides through a liquid-treating impregnation station bath and advancing the fabric through a rinsing station which includes passing the fabric over the top of a first rotating drum with one side of the fabric on the drum; (B) spraying fluid from above onto the fabric as it passes over the first rotating drum, so that fluid drains through the fabric and drum; (C) advancing the fabric and reversing the direction of the fabric so that it engages above a second rotating drum with the opposite side of the fabric exposed; (D) spraying rinsing fluid from above, onto the reversed fabric as it passes above the second rotating drum so that fluid drains through the fabric



and drum; (E) agitating the fabric between the drums as it moves in its path between the drums to reduce the build-up of air within the flattened fabric; and (F) removing excess liquid from the fabric as it exits from the rinsing station.

4,150,949

IMMUNOASSAY FOR GENTAMICIN

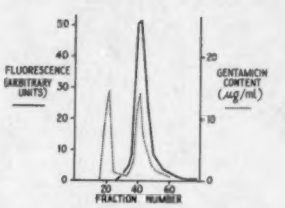
David S. Smith, London, England, assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,654

Claims priority, application United Kingdom, Apr. 15, 1976, 15736/76

Int. Cl.[2] **G01N** *21/52, 33/16*

U.S. Cl. 23—230 B **12 Claims**



1. A method of assaying a biological fluid sample for an aminoglycoside antibiotic comprising:

a. forming a mixture of the sample, a fluorescent-labelled compound, the fluorescence of which is reduced when the compound binds with antibodies, and antibody against the antibiotic under assay and the compound;

b. measuring the fluorescence of the mixture to determine the amount of reduction of fluorescence of the compound to determine the amount of aminoglycoside antibiotic present in the sample.

4,150,950

TRANSPORT SYSTEM FOR CLINICAL SPECIMENS

Milton M. Takeguchi, Painted Post, and Howard H. Weetall, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

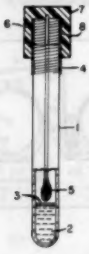
Filed Sep. 28, 1977, Ser. No. 837,361

Int. Cl.[2] **G01N** *33/16;* **A61B** *10/00*

U.S. Cl. 23—230 B **1 Claim**

1. A method for the transport of a clinical specimen of *Neisseria gonorrhoeae* wherein said speciment is immersed in a liquid reagent capable of stabilizing or preserving the activity

of said specimen, which liquid reagent has a pH of from about 8 to about 11 and is composed of TRIS buffer and a thiol



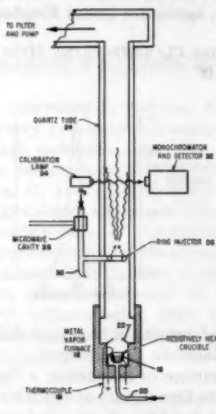
selected from the group consisting of cysteine, mercaptoethanol, dithiothreitol, and dithioerythritol.

4,150,951

MEASUREMENT OF CONCENTRATIONS OF GASEOUS PHASE ELEMENTS

Gene A. Capelle, Goleta; David G. Sutton, Huntington Beach, and Sidney W. Benson, Palos Verdes Estates, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Sep. 19, 1977, Ser. No. 834,224
Int. Cl.[2] G01N *21/26, 21/38, 27/64*
U.S. Cl. 23—232 E **6 Claims**



1. The method of quantitative and qualitative analysis of ultralow concentrations of an element in its gaseous phase with the lower limit of the range of concentrations approaching several atoms per cubic centimeter comprising:

(a) flowing a confined stream of an active metastable gaseous species selected from the group consisting of nitrogen and the noble gases;

(b) diffusely merging a flow of the gaseous phase element with the stream of the active metastable species to effect the widest dispersion of the gaseous phase element in the active metastable species;

(c) colliding said active metastable gaseous species with the gaseous phase element—thereby generating fluorescence;

(d) maintaining the ratio of the concentrations of the metastable gaseous species to the gaseous phase element high enough to preclude, within the observation zone, the depletion of the concentration of the active metastable species; and

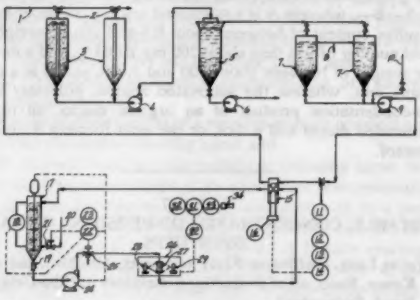
(e) measuring the intensity and the one or more wavelengths of fluorescence whereby to provide the identity of the element and its concentration.

4,150,952

METHOD OF CONTROLLING THE AMOUNT OF SEED MATERIAL IN THE PRECIPITATION STAGE OF THE BAYER PROCESS

Alonzo D. Lafleur; John T. Creehan, and Robert E. Baugh, all of Baton Rouge, La., assignors to Ormet Corporation, Burnside, La.

Filed Jul. 21, 1977, Ser. No. 817,661
Int. Cl.[2] B01D *9/00*
U.S. Cl. 23—301 **5 Claims**



1. In a method for sampling and controlling the amount of particulate seed material added to the process stream in the precipitation stage of the Bayer process for the production of alumina, the improvement which comprises:

(a) withdrawing a proportional sample of preset volume increments from the process stream utilized to precipitate the aluminum precursor in the process in a control stream;

(b) collecting said proportional sample in a dilution unit to which additional process stream liquid has been added;

(c) withdrawing a portion of the material from said dilution unit and passing said portion through a measuring device for particle sizing and total surface area measurement in order to determine the surface area of the suspended material therein; and

(d) comparing said surface area with a standard which represents a preselected surface area for suspended material and using results of said comparison to control the amount of particulate seed material added to the process stream.

2. In an apparatus for sampling and controlling the amount of particulate seed material added to the process stream at the precipitation stage of the Bayer process for the production of alumina, the improvement comprising:

(a) means for withdrawing a proportional sample of preset volume increments from the process stream utilized to precipitate the aluminum precursor in the process in a control stream;

(b) collection means and dilution means to store and dilute said proportional sample to which additional process stream liquid is added;

(c) measuring means to determine the total surface area of the suspended material within said samples in said collection means;

(d) comparison means to compare said measured surface area from said measuring means with a standard which represents a preselected surface area for suspended material; and

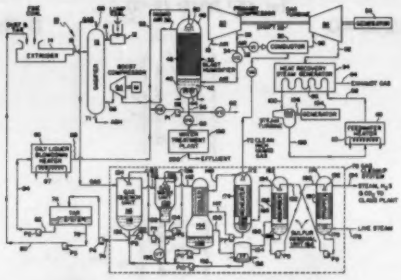
(e) control means to control the return of the control stream to the process stream.

4,150,953

COAL GASIFICATION POWER PLANT AND PROCESS

Donald E. Woodmansee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 22, 1978, Ser. No. 908,540
Int. Cl.[2] C10K *1/08*
U.S. Cl. 48—71 12 Claims



1. In an integrated coal gasification power plant comprising, in combination:

(a) a coal gasifier for producing a raw gaseous fuel by pressure gasification of coal with pressurized air and water vapor;

(b) means for pressurizing hot air and water vapor and for supplying the pressurized air and water vapor to said gasifier as blast gas therefor;

(c) a gas clean-up system adapted to (I) remove from said raw gaseous fuel at least a portion of any contaminants present therein and (II) produce (i) an aqueous blowdown liquid containing volatile hydrocarbons and (ii) a cleaned-up gaseous fuel;

(d) a combustor for combustion of said cleaned-up gaseous fuel to produce a hot expansible gaseous combustion product;

(e) means for pressurizing air and for supplying the pressurized air to said combustor;

(f) means for supplying said cleaned-up gaseous fuel to said combustor; and

(g) means operable by the combustion product for generating electric power;

the improvement comprising, in further combination with the above:

(h) means for transferring as vapor, from said blowdown liquid into relatively dry air, both (I) at least a portion of the water contained in said aqueous liquid and (II) at least a portion of the volatile hydrocarbons contained in said liquid to provide at least a portion of the hot air and water vapor supplied to said pressurizing means set forth in (b) above, whereby said blast gas supplied to said gasifier comprises as components thereof both (III) recovered water and (IV) recovered volatile hydrocarbons, said recovered components having been recovered from said blowdown liquid.

4,150,954

SPLIT GAS GENERATOR

Jöerg Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf, and Rolf Gabler, Waiblingen, all of Fed. Rep. of Germany Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

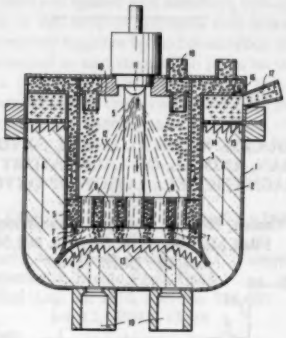
Filed Nov. 16, 1977, Ser. No. 852,032
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652337
Int. Cl.[2] C10G *11/10*
U.S. Cl. 48—102 A 21 Claims

1. A split-gas generator for catalytically converting fuel for a combustion engine comprising:

(a) a container having outer and inner wall means defining between them a catalyst chamber for containing a conversion catalyst extending longitudinally of said container, said inner wall defining an inner, spray and evaporation chamber surrounded by said catalyst chamber and communicating with said catalyst chamber;

(b) air-guide means contiguous with said catalyst chamber extending longitudinally of said container and communicating with said catalyst chamber;

(c) spray and evaporating means for introducing fuel into one end of said inner chamber;



(d) first inlet means connected to said air-guide channel means for introducing air or air and exhaust gas from a combustion engine into said air-guide channel means;

(e) means for mixing evaporated fuel with said air or said air and exhaust gas at the other end of said inner chamber to form a mixture, said mixing means having means for introducing said mixture into said catalyst chamber; and

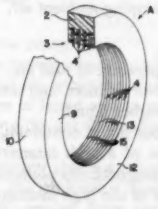
(f) means defining a split gas collection chamber communicating with the catalyst chamber for collecting split gas.

4,150,955

DEFORMABLE NON-CELLULAR POLYURETHANE POLISHING WHEEL

Ivar J. Samuelson, Fairview Park, Ohio, assignor to The Manufacturers Brush Company, Cleveland, Ohio

Division of Ser. No. 615,539, Sep. 22, 1975, Pat. No. 4,048,765, which is a continuation-in-part of Ser. No. 465,843, May 1, 1974, abandoned. This application Sep. 19, 1977, Ser. No. 834,420
Int. Cl.[2] B24B *1/00, 37/02*
U.S. Cl. 51—298 6 Claims



1. A flexible reinforced polyurethane finishing wheel for a centerless grinder comprising a dense molded non-cellular annular matrix with a diameter of at least 10 inches and an axial width of at least one inch having a circumferential reinforcing means which resists radial expansion of said matrix, the radially outer portion of said matrix being deformable and being formed of a cured solid elastomeric polyurethane composition having a no-grain Shore A durometer hardness from about 30 to about 55, a density of at least 100 pounds per cubic foot, and a tensile strength of at least 4000 pounds per square inch and being capable of being elongated several hundred percent, said elastomeric composition comprising essentially a solid linear

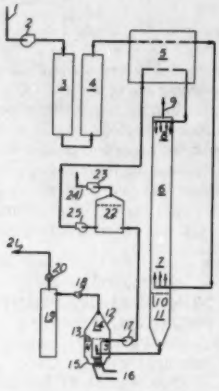
polyurethane which is the reaction product of a long-chain polyol having terminal hydroxyl groups and a molecular weight of at least 500 and an organic polyisocyanate having 2 to 3 functional isocyanate groups, said composition containing, per 100 parts by weight of said polyurethane, a minor amount no less than 50 parts by weight of finely divided abrasive refractory grains.

4,150,956

PRODUCING MEDICAL GRADE OXYGEN FOR HUMAN, ANIMAL, OR LABORATORY USE BY PARAMAGNETIC SEPARATION OF OXYGEN FROM AIR

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed Mar. 30, 1978, Ser. No. 891,548
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—48 **7 Claims**



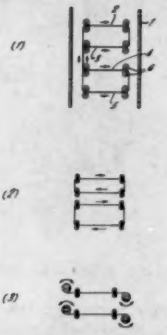
1. A method of manufacturing or producing medical grade oxygen for human, animal, or laboratory use by paramagnetic separation of oxygen from air comprising the steps of:
- compressing or pumping ambient air,
- filtering said air,
- sterilizing said air,
- adjusting the temperature of said air,
- dissolving said air in an inert, and non-magnetic, nontoxic, nonvolatile, absorber liquid,
- passing the absorber liquid containing the dissolved air between the poles of a high intensity magnet to thereby evolve oxygen magnetically collecting the dissolved oxygen at the poles of the high intensity magnet,
- collecting the effervescent, released oxygen,
- transferring the produced oxygen to storage, or
- transferring the produced oxygen to direct use,
- controlling the pressure of oxygen released to use,
- stripping the absorber liquid after oxygen removal of dissolved nitrogen,
- filtering the absorber liquid of particulates collected in the system,
- adjusting the temperature of the absorber liquid prior to injection back into the dissolving step,
- recycling the absorber liquid to the dissolving step,
- recycling non dissolved air from the dissolving step back to and with the air injection in the dissolving step.

4,150,957

METHOD OF CONTACTING LIQUID AND GASEOUS PHASES

Christian R. Josis, Gembloux, Belgium, assignor to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Jun. 15, 1976, Ser. No. 696,181
Claims priority, application Belgium, Jun. 24, 1975, 830596
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—53 **11 Claims**



1. In a method of contacting liquid and gaseous phases in a column having a plurality of perforated plates spaced one above another, the improvement comprising the steps of:
- purifying the liquid phase by
- passing the liquid phase downwardly through the column successively over the plurality of plates while
- passing the gaseous phase upwardly through the column;
- withdrawing the gaseous phase from the column and removing any liquid suspended therein;
- subjecting each plate to rotational or translational movement; and
- simultaneously subjecting at least one of the faces of each plate to a cleaning operation.

4,150,958

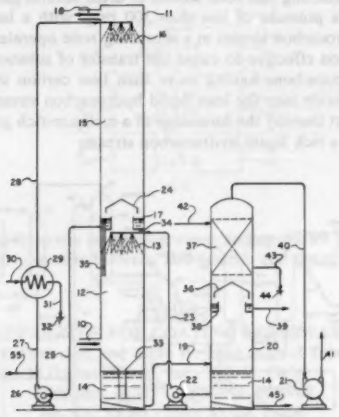
TREATMENT OF WASTE LIQUOR

Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Division of Ser. No. 640,331, Dec. 12, 1975, Pat. No. 4,061,531.
This application Sep. 16, 1977, Ser. No. 833,917
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.[2] B01D *53/14*
U.S. Cl. 55—70 **14 Claims**

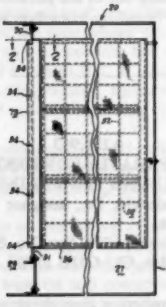
1. A process for separating hot industrial gas into its components without addition of external heat comprising:
- (a) feeding said gas directly from collecting mains of said industrial process to the first stage of a primary cooler;
- (b) directing contacting said gas in said first stage with an aqueous brine, derived from step (m) hereinbelow, to cool said gas, to transfer components from said gas to the brine, and to heat said brine;
- (c) passing said cooled gas from said first stage to a second stage of said primary cooler;
- (d) directly contacting said gas in said second stage with a condensed liquor derived from step (l) hereinbelow to further cool said gas, to transfer components from said gas to said condensed liquor, and to heat said condensed liquor;
- (e) withdrawing said further cooled gas from said second stage as the overhead from said primary cooler;
- (f) passing said heated brine from said first stage directly to an evaporator without addition of further heat to said heated brine;
- (g) applying a vacuum to said brine in said evaporator to boil

said brine and form a cooled concentrated brine and a vapor without addition of heat;
(h) condensing a portion of said vapor in an indirect condenser to form a condensate and separately withdrawing said condensate and said uncondensed vapors;
(i) withdrawing a portion of said cooled concentrated brine from said evaporator as concentrated product;



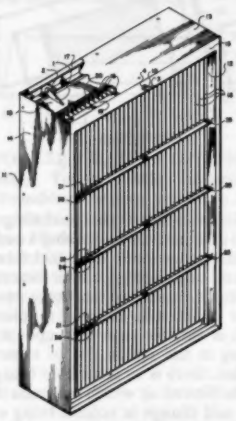
(j) passing at least a portion of said heated condensed liquor from said second stage to an indirect heat exchanger;
(k) removing heat from said heated condensed liquor in said heat exchanger to cool said liquor passed thereto;
(l) feeding said cooled liquor from step (k) to said second stage for use in step (d); and
(m) feeding a portion of said cooled concentrated brine from step (g) to said first stage for use in step (b).

4,150,959
ELEMENTS FOR DUST COLLECTOR
Frank A. Bielak, 1742 Wagar Rd., Rocky River, Ohio 44116
Filed Sep. 16, 1976, Ser. No. 723,807
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—341 HM **6 Claims**



1. In a dust collection apparatus, which has a dividing wall defining a high pressure side and a low pressure side which wall includes a plurality of spaced filter bags; the improvement of a spacer for positioning in the filter bags to prevent the bags from collapsing during functioning of the dust collection apparatus, said spacer comprising first and second parts, each part including a first plurality of generally parallel and longitudinally extending spaced grid members and a second plurality of generally parallel and longitudinally extending spaced grid members extending transverse to said first plurality, said first and second plurality of grid members connected together at their crossing points to form a plurality of support junctures, said first and second plurality of spaced grid members lying substantially in the same plane, opposed end portions of said second plurality of grid members being integrally formed into a curved configuration which extends out of the plane in which said first and second plurality of spaced grid members lie, first and second auxiliary grid members at the ends of said curved configuration of said second plurality of grid members and being respectively connected thereto, each of said first and second auxiliary grid members extending in the same direction as said first plurality of spaced grid members, connection posts formed at some of said support junctures, said first and second parts being connected together by said connection posts on one part being connected to said connection posts on the opposite part to form a chamber when covered by a filter bag, said connection posts being the only members within the confines of said chamber tending to obstruct the free flow of air in said chamber.

4,150,960
MOVEABLE TOP SEAL FOR AN ELIMINATOR SHEET CORE
A. Keith Pooser, Jr., Winston-Salem, N.C., assignor to Envirotech Corporation, Menlo Park, Calif.
Filed Aug. 23, 1976, Ser. No. 716,607
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—440 **6 Claims**



1. An eliminator core comprising:
a. a structural frame having a box-like configuration defining an inlet at one end for admitting a gas stream containing entrained particles of liquid and an outlet at the opposite end for discharging the gas stream free of entrained particles of liquid;
b. a pluality of eliminator sheets mounted in parallel in said structural frame, the eliminator sheets of said plurality being horizontally spaced from one another, disposed uprightly and generally parallel to the direction of flow of the gas stream from said inlet to said outlet through said frame, said plurality of sheets forming a bundle having tortuous flow paths therebetween to channel and act on the gas stream passing through said bundle to remove entrained liquid particles from the gas stream;
c. a grid above said eliminator bundle defined by a plurality of support members including a first support member mounted to said structural frame above said eliminator bundle to fixedly extend across said inlet end and a second support member mounted to said structural frame above said eliminator bundle to fixedly extend across said outlet end;

d. a closure member hinged to said first support member above said bundle to operate below the top of said grid and hingedly moveable between a contact position, whereat said closure member contacts the top edges of said eliminator sheets within said bundle, and an open position whereat said closure member is pivoted upward from said top edges of the eliminator sheets and does not contact the eliminator sheets; and

e. a displacement means mounted to said first support member to engage said closure member and to selectively move the same between the contact position and the open position, said displacement means positioned to operate below the top of said grid.

4,150,961

AIR INTAKE ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

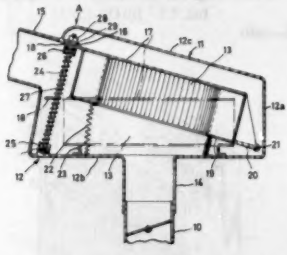
George Atkins, 68, Priory Ave., Bridgend, Mid Glamorgan, Wales

Filed May 5, 1977, Ser. No. 794,055

Claims priority, application United Kingdom, Jan. 12, 1977, 1192/77

Int. Cl.[2] F02M *35/00*

U.S. Cl. 55—385 R **9 Claims**



1. An internal-combustion engine including an air intake arrangement, said arrangement comprising a carburetor choke tube; an intake passage upstream from said tube; a casing between said tube and said passage; a filter element mounted in said casing, the filter element and the intake passage upstream of the carburetor choke tube defining a volume containing filtered air which is variable such that, upon a change in air pressure occurring in this region due to a particular engine operating condition, there is an immediate change in said volume containing the filtered air which maintains the air pressure therein constant, said change in volume being effected by the filter element being movable in the casing, and means sealing said element against the ingress of air except through its filtration surface.

4,150,962

PRETREATMENT OF RAW NATURAL GAS PRIOR TO LIQUEFACTION

John W. Colton, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 641,119, Dec. 15, 1975, Pat. No. 4,070,165. This application Oct. 26, 1977, Ser. No. 845,525

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] F25J *3/02*

U.S. Cl. 62—17 **1 Claim**

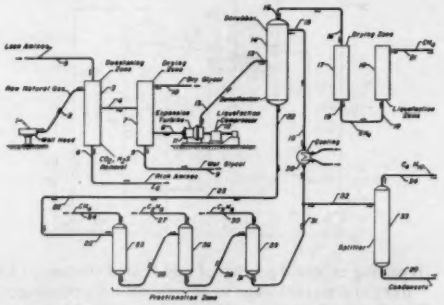
1. A process for the treatment of raw natural gas prior to liquefaction which comprises:

(a) passing a stream of raw natural gas having a pressure above 800 psig. through a sweetening zone operated at conditions effective to remove carbon dioxide and hydrogen sulfide therefrom and to thereby effect the formation of a stream of sweetened natural gas;

(b) passing the stream of sweetened natural gas through a first drying zone operated at conditions effective to remove water therefrom and to effect the formation of a stream of dried natural gas having a dew point below −20° F.;

(c) depressurizing the total stream of dried natural gas in an energy recovery means developing shaft horsepower to a pressure under 300 psig;

(d) contacting said total stream of dried natural gas possessing a pressure of less than 300 psig. with a lean liquid hydrocarbon stream in a scrubbing zone operated at conditions effective to cause the transfer of substantially all hydrocarbons having more than two carbon atoms per molecule into the lean liquid hydrocarbon stream and to effect thereby the formation of a methane-rich gas stream and a rich liquid hydrocarbon stream;



(e) passing the methane-rich gas stream into a second drying zone operated at conditions effective to remove water from the methane-rich gas stream and to effect the formation of a dry gas stream having a dew point below about −240° F.;

(f) passing the rich liquid hydrocarbon stream into a fractionation zone operated at conditions effective to separate hydrocarbons having from one to three carbon atoms per molecule from the rich liquid hydrocarbon stream and to effect thereby the formation of a C_4-plus liquid hydrocarbon stream; and,

(g) dividing the C_4-plus liquid hydrocarbon stream into two portions and passing one of the portions into the scrubbing zone as the lean liquid hydrocarbon stream.

4,150,963

METHOD AND APPARATUS FOR RESTRAINING GLASS DURING TEMPERING

Vaughn R. Imler, Valencia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1978, Ser. No. 883,570

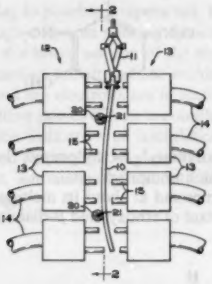
Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—114 **7 Claims**

1 Apparatus for tempering glass sheets vertically hung from tongs comprising:

a pair of opposed blast heads flanking a vertically extending glass sheet receiving space, each blast head including an array of nozzles extending toward said glass sheet receiving space and adapted to direct streams of fluid tempering medium toward opposite major surfaces of a glass sheet vertically hung in said space, means for supplying pressurized tempering medium to the blast heads, restraining wires extending along one side of the glass sheet receiving space in front of said nozzles and adapted to limit the extent to which the glass sheet swings to one side, a plural-

ity of spaced-apart discs carried on and radially projecting from each of the restraining wires so as to space the glass



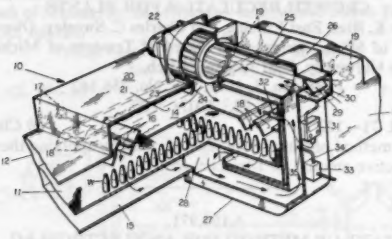
sheet from the restraining wires, and means for providing relative motion between said nozzles and the glass sheet.

4,150,964

APPARATUS FOR COATING GLASSWARE

William E. Hofmann, and Alton W. Long, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 31, 1977, Ser. No. 763,768
Int. Cl.[2] C03C *17/00, 35/02, 39/00*
U.S. Cl. 65—181 **3 Claims**



1. Apparatus for applying a lubricious coating to newly formed glassware that are in the process of being annealed in an annealing lehr of the type where the ware are arranged in rows and columns on a porous lehr belt conveyor and are still at a temperature of between 200° F. and 400° F., comprising:

an equalizing cooling section, surrounding a section of the conveyor, said conveyor moving ware through the cooling section;

a blower or fan connected to said cooling section for circulating air around the ware in said cooling section;

a generally imperforate ceiling extending over the ware in the section;

first louvre means in said ceiling extending across the width of said section at the upstream thereof;

second louvre means in said ceiling extending parallel to the movement of ware on said conveyor;

a chamber enclosing the upper surface of said ceiling;

duct means extending from the outlet of said blower to the chamber;

return duct means from beneath the lehr belt to the inlet of the blower;

means for introducing ambient air to the inlet side of said blower in controlled quantities;

at least one means for generating a mist of an organic, nonmetallic coating material selected from the group consisting of polyolefins, fatty acids and their derivatives;

means for carrying the mist from the generator in a vertically upward path of at least one foot and for introducing the mist into the circulating air within the cooling section to thereby apply a lubricious coating to the ware as it passes through the section.

4,150,965

AMMONIUM NITRATE CONTAINING FERTILIZER PELLETS AND A PROCESS OF MAKING SAME HAVING A COATING OF C_{12}–C_{18} ALKYL AMINE(S) AND AN OVERCOAT OF MINERAL OIL

Willy H. P. Van Hijfte, Assenede; Rafaël A. J. Goethals, Ertvelde; Anton Niks, Sledderlo bij Genk, all of Belgium, and Gerardus F. van der Sijpt, Koewacht, Netherlands, assignors to Compagnie Neerlandaise de l'Azote (Societe Anonyme), Brussels, Belgium

Filed Apr. 20, 1978, Ser. No. 898,331
Claims priority, application Netherlands, Apr. 28, 1977, 7704686
Int. Cl.[2] B01J *2/30;* **C05C** *1/02*
U.S. Cl. 71—27 **11 Claims**

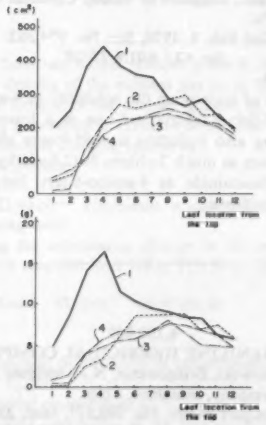
1. Ammonium nitrate containing fertilizer pellets having improved properties during storage and transportation, characterized in that the individual fertilizer pellets have a uniform and substantially continuous coating of C_{12}–C_{18} alkylamine(s) in the solid state throughout their entire surface, and a thin layer of mineral oil over said coating.

4,150,966

METHOD FOR CULTIVATION OF TOBACCO PLANTS

Hideshi Tsuchiya, Tokyo; Tetsuo Takamatsu, Utsunomiya; Masakazu Furushima, Niigata, and Shiro Hojo, Marugame, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc. and Japan Hydrazine Co., Inc., both of Tokyo, Japan

Continuation of Ser. No. 600,479, Jul. 30, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,543
Claims priority, application Japan, Jul. 31, 1974, 49-87071
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—78 **2 Claims**



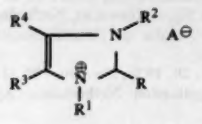
1. A method of cultivating tobacco plants thereby increasing the yield of tobacco during cultivation, which comprises spraying the tobacco leaves with an aqueous solution containing 1,000 to 8,000 p.p.m. of a choline salt of maleic hydrazide.

4,150,967
AGENTS FOR REGULATING PLANT GROWTH

Klaus Lürssen, Berg. Gladbach; Ulrich Holtschmidt, and Günter Schwarzmann, both of Essen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,969
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706839
Int. Cl.[2] A01N *5/00, 9/22*
U.S. Cl. 71—92 39 Claims

1. A method of regulating the growth of plants, which comprises applying to the plants, or to a habitat thereof, a quaternary imidazolium compound of the general formula



(I),

in which

R represents hydrogen or unbranched alkyl with 1 to 3 carbon atoms,

R^1 represents alkyl with 8 to 16 carbon atoms,

R^2 represents hydrogen, alkyl with 1 to 12 carbon atoms or optionally substituted benzyl, where the substituent is halogen,

R^3 represents hydrogen or methyl,

R^4 represents hydrogen or methyl, and

$A^{\ominus}$ represents an equivalent of a halide or alkyl sulphate anion, alone or in admixture with a diluent or carrier.

4,150,968
EMULSIFIABLE LIQUID CONCENTRATES CONTAINING 4-AMINO-6-T-BUTYL-3-(METHYLTHIO)-1,2,4-TRIAZIN-5-ONE AND 2-CHLORO-N-(2,6-DIETHYLPHENYL)-N-METHOXYMETHYLACETAMIDE

James W. Young, Kansas City, Mo., and Joseph Synek, Overland Park, Kans., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,302
Int. Cl.[2] A01N *17/08*
U.S. Cl. 71—93 8 Claims

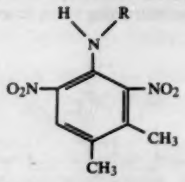
8. A method of improving the solubility of 4-amino-6-tert-.butyl-3-methyl-thio-1,2,4-triazin-5-one in a lower akyl benzene comprising also including in said lower alkyl benzene about 3 to 5 times as much 2-chloro-N-(2,6-diethylphenyl)-N-methoxymethylacetamide as 4-amino-6-tert. butyl-3-methyl-thio-1,2,4-triazin-5-one.

4,150,969
2,6-DINITROANILINE HERBICIDAL COMPOSITIONS

Joseph J. Dudkowski, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 780,377, Mar. 23, 1977, Pat. No. 4,082,537. This application Dec. 29, 1977, Ser. No. 865,541
Int. Cl.[2] A01N *17/00*
U.S. Cl. 71—121 7 Claims

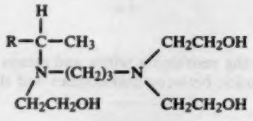
6. A method of preventing the formation of crystals in wettable powder formulations of compounds of the formula



wherein R is 1-ethylbutyl, 1-ethylpropyl, 1-methylpropyl or 1-methylbutyl which comprises

melting the compound at about its melting point,

adding a surfactant of ethoxylated β-diamines of the formula



wherein R is C_9–C_{20} in an amount effective to prevent crystallization of the dinitroaniline,

stirring the mixture until a homogeneous solution results, and then

cooling the melt until it resolidifies.

4,150,970
GROWTH REGULATOR FOR PLANTS

Stanley K. Ries, East Lansing, and Charles C. Sweeley, Okemos, both of Mich., assignors to Board of Trustees of Michigan State University, East Lansing, Mich.

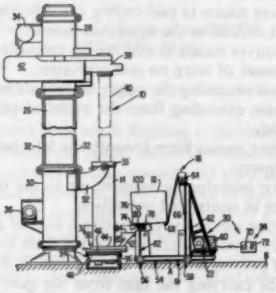
Filed Jan. 3, 1977, Ser. No. 756,142
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—122 20 Claims

1. A method of stimulating plant growth by applying thereto an effective amount of 1-triacontanol.

4,150,971
START-UP METHOD FOR AN ELECTROSLAG REMELTING SYSTEM

Boris I. Medovar; Yury V. Latash; Alexsey G. Bogachenko, all of Kiev; Gary P. Kaganovsky, Zaporozhie; Semen A. Leibenzon, Zaporozhie; Konstantin S. Eltsov, Zaporozhie; Georgy K. Gabuev, Zaporozhie, and Zinoviy I. Poticha, Zaporozhie, all of U.S.S.R., assignors to Institut Elektrosvarki IM.E.O. Patona, Kiev, U.S.S.R.

Division of Ser. No. 72,327, Sep. 15, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,386
Int. Cl.[2] H05B *3/60*
U.S. Cl. 75—10 R 16 Claims



1. A slag handling method for the start-up of an electroslag

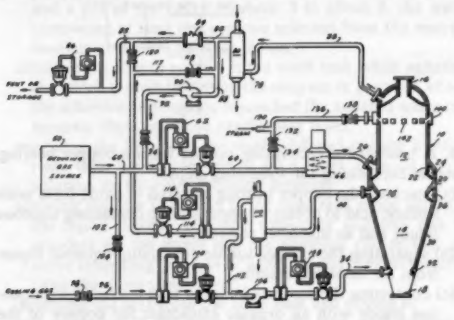
remelting furnace which includes an electric power circuit enabling current to pass through at least one electrode and molten slag within a mold comprising the steps of: raising a body of molten slag to pouring temperature; transferring of the molten slag through a bottom pouring device in fluid communication through the lower portion of the mold of the remelting furnace to a start-up remelting zone within the mold so that the molten slag and the electrode are in electrical contact and the furnace remelting power circuit is completed; and, responsive to a condition indicative of completion of the furnace power circuit upon the molten slag and the electrode making electrical contact, automatically discontinuing said transferring of molten slag.

4,150,972

CONTROLLING CARBURIZATION IN THE REDUCTION OF IRON ORE TO SPONGE IRON

Juan F. Price-Falcon; Patrick W. MacKay, both of Garza Garcia; Enrique R. Martinez-Vera, and Gilberto Guerra-Garcia, both of Monterrey, all of Mexico, assignors to Fierro Esponja, S.A., Mexico

Filed Nov. 17, 1977, Ser. No. 852,535
Int. Cl.[2] C21B *13/02*
U.S. Cl. 75—35 **7 Claims**



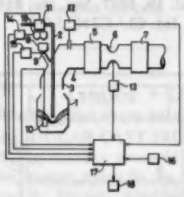
1. In a process for reducing particulate metal ore to sponge metal in a vertical shaft, moving bed reactor having a reduction zone in the upper portion thereof in which a hot reducing gas largely composed of carbon monoxide and hydrogen is caused to flow through a portion of said bed to reduce the metal ore thereof to sponge metal and a cooling zone in the lower portion of the reactor for cooling the sponge metal, the method of inhibiting the carburization of the sponge metal in said reduction zone which comprises circulating a reducing gas in a loop which comprises said reduction zone and an external conduit interconnecting the top and bottom of said reduction zone and containing a cooler for de-watering the effluent gas from said reduction zone, supplying fresh reducing gas from a source of said gas outside said loop to a point in said loop between said cooler and said reactor, and adding steam to the reducing gas in the upper portion of said reducing zone to reduce the carbon monoxide content of the effluent gas from the reduction zone and thereby decrease the amount of carburization in said reduction zone.

4,150,973

METHOD OF CONTROLLING MOLTEN STEEL TEMPERATURE AND CARBON CONTENT IN OXYGEN CONVERTER

Shin-ichi Sanuki, Kishiwada; Yuziro Ueda, Sakai; Toru Yoshida, Sakai; Tomoaki Kume, Sakai, and Kosaburo Ikenouchi, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 11, 1977, Ser. No. 767,762
Claims priority, application Japan, Feb. 24, 1976, 51-18445; Feb. 24, 1976, 51-18446
Int. Cl.[2] C21C *5/30*
U.S. Cl. 75—60 **8 Claims**



1. A method of controlling the temperature and the carbon content of molten steel in an oxygen converter so that the temperature and the carbon content of the molten steel at blow end will be within a desired range of values, comprising the steps of:

measuring the composition of and the amount of the charge within the converter;

blowing the oxygen into the molten steel and continuously measuring the amount of oxygen supplied;

directly measuring the temperature and the carbon content of the molten steel during the oxygen blowing without interruption of the blowing;

continuously measuring the composition and flow rate of the exhaust gases;

calculating the continuous change in the amount of decarbonization, which amount is calculated by performing integration of the decarbonization velocity Vc(t), said decarbonization velocity being defined as:

$$Vc(t) = \{Fex(t) \cdot (Xco(t) + Xco_2(t)) \cdot 10^{-2} - \sum_i (\gamma_i \cdot Wfi(t))\} \cdot \frac{12}{22.4} \cdot 10^{-3}$$

wherein:

Fex = the flow rate of the exhaust gases in Nm^3/hr.

Xco = the density of the exhaust gas co in %

Xco_2 = the density of the exhaust gas co_2 in %

γ = the co_2 generating coefficient of the flux in Nm^3/ton

Wf = the amount charged in ton/hr

i = the type of flux

t = time

and $(12/22.4)\cdot 10^{-3}$ represents a conversion constant for units being used;

calculating the continuous change in the amount of total converter reaction heat value T(t) from the relationship:

$$T(t) = To + \delta \int dT(t)\cdot dt - \int (ei \cdot Wfi(t))\, dt$$

wherein:

dT = the amount of variation in instantaneous tempterature rise in ° C./hr

To = the initial temperature in °C.

ϵ = the cooling coefficient of the flux in ° C./ton

δ = the coefficient of thermal efficiency;

obtaining a future locus variation of the temperature and the carbon content by plotting the values measured and calculated and obtaining the formula of a curve which interconnects the values thereby establishing a relationship which

correlates the temperature and the carbon content of the molten steel;

predicting the final range of the temperature and the carbon content of the molten steel at the blow end by extrapolating said future locus variation; and

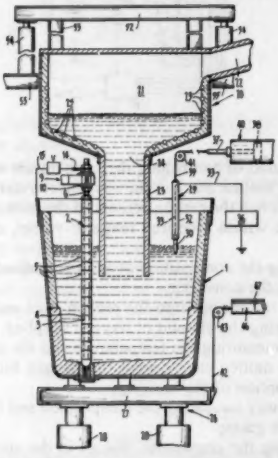
controlling at least one operating parameter in response to a difference between the desired range and the predicted range.

4,150,974

INDICATION OF LEVELS IN RECEPTACLES

Kenneth G. Kemlo, Lambton, Australia, assignor to The Broken Hill Proprietary Company, Limited, Victoria, Australia

Filed Jul. 19, 1977, Ser. No. 816,930
Int. Cl.[2] C21C *5/30*
U.S. Cl. 75—60 **10 Claims**



1. A method of determining the interface between molten metal and slag in a container utilising an electrode adapted for positioning within the container in electrical contact with the material in the container, indicating means for indicating at least a first range of voltages produced at said electrode by an electrochemical reaction between the molten metal and the electrode as well as at least a second range of voltages produced at said electrode by an electrochemical reaction between the slag and the electrode, and means for supporting said electrode independently of said ladle and adapted to enable said electrode to be raised or lowered within, and relative to, said container, said method involving moving said electrode to a position within said container and subsequently, during relative movement between the electrode and the material in the container, noting the position at which the electrode and the interface are at the same level in the container as indicated by a change in the voltage from one range of said voltages to the other.

4,150,975

PROCESS FOR PRODUCING METALLIC CHROMIUM

Hiroshi Miyake; Satoru Tenma; Nobuyoshi Sato, and Akira Honda, all of Yamagata, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jul. 6, 1978, Ser. No. 922,590
Claims priority, application Japan, Jul. 12, 1977, 52-82566
Int. Cl.[2] C22B *34/32*
U.S. Cl. 75—101 R **8 Claims**

1. A process for producing metallic chromium which comprises the steps of:

reducing a chromium- and iron-containing ore in the presence of a carbonaceous material to obtain a ferro-chrome;

treating the ferro-chrome with a chlorinating agent to obtain an aqueous solution containing chromium chloride and ferrous chloride;

oxidizing the ferrous ion present in the aqueous solution containing chromium chloride and ferrous chloride, into the ferric ion;

contacting the aqueous ferric ion-containing solution with an extractant to extract the ferric ion therefrom;

treating the chromium chloride of the aqueous solution, from which the ferric ion has been extracted, in an oxidizing atmosphere maintained at a temperature of from 500° to 1,400° C. by an oxidizing flame where the chromium chloride is roasted to be thereby converted to chromium oxide, and; then,

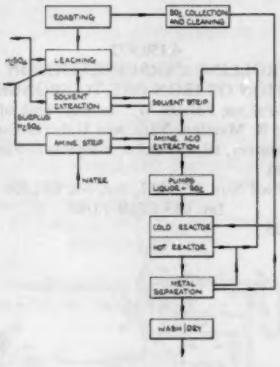
reducing the chromium oxide into metallic chromium.

4,150,976

METHOD FOR THE RECOVERY OF METALLIC COPPER

Richard J. Dain, Crouch, Nr. Borough-Green, England, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Jun. 19, 1978, Ser. No. 916,675
Int. Cl.[2] C22B *15/10*
U.S. Cl. 75—117 **12 Claims**



1. A process for recovering copper from a copper bearing material comprising the following steps:

(a) leaching the copper bearing material in oxide form with sulfuric acid to obtain a copper sulfate containing aqueous liquor and an insoluble residue;

(b) separating the copper sulfate-containing aqueous liquor from the insoluble residue;

(c) contacting the separated copper sulfate-containing aqueous liquor with an organic extractant for copper of the ionic exchange type having substantially greater affinity for copper ions than other cations present in the aqueous leach liquor to extract the copper value from the aqueous leach liquor;

(d) contacting the copper containing organic extractant with an aqueous solution of sulfuric acid to strip the copper in the form of copper sulfate from the copper-carrying organic extractant, thus reconstituting the organic extractant and forming a purified aqueous acidic copper sulfate solution;

(e) passing the purified aqueous acidic copper sulfate solution to an amine solvent extraction step wherein an organic solution of amine salt is formed, separating the amine salt and contacting it with water whereby the amine is regenerated and sulfuric acid is recovered from the amine salt solution;

(f) contacting the copper sulfate-containing solution with a sulfur dioxide type reductant whereby metallic copper is precipitated and sulfuric acid solution is produced;

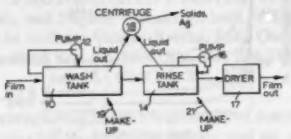
(g) recycling the sulfuric acid solution to the copper stripping step; and

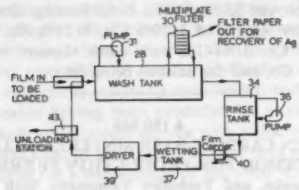
(h) recovering the precipitated copper.

4,150,977
PROCESS FOR STRIPPING PHOTOGRAPHIC MATERIALS

Patrick A. Phillips, Weston, Canada, assignor to Keltek Processing, Inc., Boston, Mass.

Filed Oct. 27, 1977, Ser. No. 846,189
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—118 P **7 Claims**





1. A method of treating photographic film consisting of a plastic base layer, an overlayer of adhesive, and an organic layer containing silver, to recover silver therefrom, comprising the steps:

passing the film into a wash tank containing hot water at a temperature in the range from about 30° C. to about 60° C. and a pH in the range of about 5 to about 9, the water containing at least one enzyme selected from the enzyme families: protease, amylase, lipase;

allowing the film to remain in the wash tank while agitating the water therein, whereby the enzyme or enzymes attack the adhesive and organic layers and the agitated water can separate them from the plastic base layer,

removing the film from the wash tank and passing it into a rinse tank containing one of (a) a weak aqueous glycol solution, or (b) a weak caustic solution;

allowing the film to remain in the rinse tank while agitating the liquid therein, whereby remaining adhesive can be attacked by the liquid and the agitation can further remove remaining portions of adhesive and organic material from the plastic base layer,

removing the film from the rinse tank and drying it,

and removing liquid from the wash tank and passing it through means for abstracting silver therefrom.

4,150,978
HIGH PERFORMANCE BEARING STEELS

Rene Schlatter, and Robert S. Hodder, both of Latrobe, Pa., assignors to Latrobe Steel Company, Latrobe, Pa.

Filed Apr. 24, 1978, Ser. No. 898,803
Int. Cl.[2] C22C *38/24*
U.S. Cl. 75—126 C **12 Claims**

1. A wear and corrosion resistant steel characterized by superior rollings contact fatigue life and low retained austenite consisting essentially of:

C	about	0.8 - 1.6%	
Si	about	0.50%	Max.
Mn	about	0.50%	Max.
S	about	0.10%	Max.
P	about	0.015%	Max.
Cr	about	12 - 20%	
Mo	about	2 - 5%	
W	about	Up to 3.0%	
V	about	0.5% - 3.0%	
Ti	about	Up to 0.5%	
Al	about	0.03%	Max.
Ni	about	0.50%	Max.
Co	about	0.50%	Max.
Cu	about	0.50%	Max.
B	about	0.05%	Max.
N	about	0.05%	Max.
Fe + incidental impurities	Balance		

and having been made by vacuum arc remelting electrodes prepared by vacuum induction melting.

4,150,979
METHOD OF CONTINUOUS PRODUCTION OF NODULAR CAST IRON

Evgeny A. Vasiliev, Kutuzovsky prospekt 1/7, kv. 37; Petr S. Sirotinsky, Profsojuznaya ulitsa 96, kv. 79, both of Moscow, U.S.S.R.; Dmitry P. Ivanov, deceased, late of Moscow, U.S.S.R., and by Vitaly D. Ivanov, administrator, ulitsa Vavilova 89, kv. 56, Moscow, U.S.S.R.

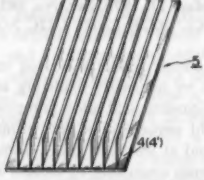
Filed Aug. 19, 1977, Ser. No. 826,050
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 R **7 Claims**

1. A method for continuous production of nodular iron comprising: melting, in a furnace, a foundry charge of cast iron containing at least 2% by weight carbon to obtain a primary melt filling up to ⅔ of the furnace volume; introducing solid iron into the primary melt, to form a secondary melt, said solid iron containing 0.2 to 0.5% by weight of a graphite-spheroidizing element, to fill the entire furnace volume, thereby effecting spheroidization of the melt, and subsequently heating the secondary melt in said furnace to a melt tapping temperature.

4,150,980
ALUMINUM ALLOY EXCELLENT IN HIGH-TEMPERATURE SAGGING RESISTANCE AND SACRIFICIAL ANODE PROPERTY

Shigetake Imaizumi, Susono; Kazuo Yamada, Mishima, and Katashi Katsumata, Susono, all of Japan, assignors to Mitsubishi Aluminum Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,212
Int. Cl.[2] C22C *21/10*
U.S. Cl. 75—146 **2 Claims**



1. An aluminum alloy excellent in the high-temperature sagging resistance and the sacrificial anode property, which consists essentially of, in weight percentage:

zinc: from 0.5 to 8.0%,

manganese from 0.5 to 1.5%, and

the balance aluminum and incidental impurities;

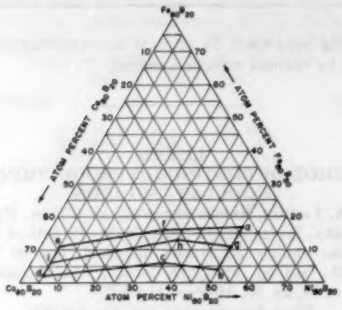
said alloy being particularly adapted to be used as a fin material for a tube of a heat exchanger.

4,150,981

GLASSY ALLOYS CONTAINING COBALT, NICKEL AND IRON HAVING NEAR-ZERO MAGNETOSTRICTION AND HIGH SATURATION INDUCTION

Robert C. O'Handley, Morris Plains, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 15, 1977, Ser. No. 824,590
Int. Cl.[2] C22C *19/07, 19/00*
U.S. Cl. 75—170 6 Claims



1. A magnetic alloy that is substantially glassy, consisting essentially of about 13 to 73 atom percent cobalt, about 5 to 50 atom percent nickel, about 2 to 17 atom percent iron, with the proviso that the total of cobalt, nickel and iron is about 80 atom percent, and the balance essentially boron plus incidental impurities, said alloy having a value of magnetostriction ranging from about $+3\times10^{-6}$ to -3×10^{-6} and a saturation induction of at least about 8 kGauss.

4,150,982

AG-METAL OXIDES ELECTRICAL CONTACT MATERIALS CONTAINING INTERNALLY OXIDIZED INDIUM OXIDES AND/OR TIN OXIDES

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Japan

Filed Mar. 13, 1978, Ser. No. 885,536
Int. Cl.[2] B32B *15/00;* C22C *5/10*
U.S. Cl. 75—173 A 4 Claims

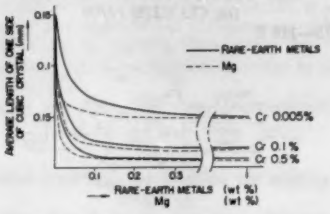
1. An electrical contact material having improved contact resistance obtained by internally oxidizing an alloy of silver and solute metal elements, said alloy comprising a silver matrix, 3 to 11 weight percent of a first primary solute metal consisting of tin, and at least one other primary solute metal selected from a group consisting of indium and bismuth, the total weight percent of said primary solute metals being 3.01 to 16, and said alloy further comprising 0.1 to 5 weight percent of at least one additional solute metal element selected from a group consisting of Zn, Cd, and Ca, and which is diffused into the aforementioned internally oxidized alloy matrix and then is internally oxidized, each said additional metal element being precipitated in said alloy matrix and having the property of decomposing and subliming at a temperature about or lower than the melting point of silver.

4,150,983

TIN BASE WHITE METAL BEARING ALLOYS

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Sep. 12, 1977, Ser. No. 832,696
Claims priority, application Japan, Apr. 22, 1977, 52-47137
Int. Cl.[2] C22C *13/00*
U.S. Cl. 75—175 A 20 Claims



1. An improved Sn base white metal bearing alloy consisting essentially by weight of 1–10% Cu, 3–15% Sb, 0–15% Pb, 0.005–0.5% Cr, 0.001–1% rare earth element or elements, 0.005–0.5% Co, and the balance being Sn.

4,150,984

TUNGSTEN CARBIDE-BASE SINTERED ALLOYS AND METHOD FOR PRODUCTION THEREOF

Hiroshi Tanaka, and Yoshihiro Yamamoto, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Sep. 15, 1977, Ser. No. 833,611
Int. Cl.[2] B22F *3/00;* C22C *29/00*
U.S. Cl. 75—238 8 Claims

1. A tungsten carbide-base sintered alloy of a compact three-phase structure which consists of a grain phase of very fine grains of a metal carbide composed mainly of tungsten carbide, a grain covering phase of a complex carbo-nitride of titanium and the metal element of the metal carbide, surrounding the fine grains, and a bonding phase composed mainly of nickel.

6. A method for producing a tungsten carbide-base sintered alloy of a compact three-phase structure which consists of a grain phase of a metal carbide composed mainly of tungsten carbide, a grain covering phase of a complex carbo-nitride of titanium and a metal element composed mainly of tungsten in the metal carbide, and a bonding phase composed mainly of nickel; said method comprising adding a small amount of a carbon powder to a mixture consisting of 5 to 25% by weight of a nickel powder, a titanium carbide nitride powder which may contain 2 to 20% by weight of a titanium nitride powder, and the remainder being a metal carbide powder composed mainly of a tungsten carbide powder, and molding and sintering the mixture.

4,150,985

IMAGE FORMING PROCESS INVOLVING PHASE CHANGE

Meredith D. Shattuck, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 532,356, Dec. 13, 1974, abandoned. This application Mar. 14, 1977, Ser. No. 777,224
Int. Cl.[2] G03G *13/06;* G03C *5/24*
U.S. Cl. 96—1 R 7 Claims

7. A process for forming a visible image consisting essentially of corona charging and exposing to a light pattern a plate comprising an electrically conductive substrate and on said substrate only a single layer of a photoconductive, non-polymeric, film-forming pyrazoline, oxadiazole, of fluorenone organic compound which has a glass transition temperature below 200° C., and which has both a crystalline phase and an amorphous phase, and developing the plate by contacting the organic compound with a liquid in which the organic compound is only slightly soluble, said developing causing a selec-

tive change in phase between the light exposed and non-exposed areas, said selective change in phase being either from the crystalline phase to the amorphous phase, or from the amorphous phase to the crystalline phase.

4,150,986
DOPED TiO_2 ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Kei Takahata, and Hajime Murakami, both of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Sep. 17, 1976, Ser. No. 724,216
Int. Cl.[2] G03G *5/087, 5/09*
U.S. Cl. 96—1.5 R **15 Claims**

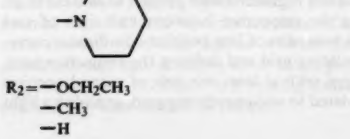
1. An electrophotographic photosensitive material comprising an electrically conductive substrate and an electrophotographic photosensitive layer positioned thereon and used in an electrophotographic method which comprises charging the electrophotographic photosensitive layer followed by exposing and developing, characterized in that said photosensitive layer consists essentially of zinc-doped titanium dioxide disposed in an electrically insulating resin binder, said zinc-doped titanium dioxide having been produced by mixing titanium dioxide or hydrated titanium dioxide with a zinc compound in a Ti/Zn molar ratio of 100:0.1 to 100:5 and then calcining the resulting mixture at a temperature of 700°–980° C. for 0.1 to 3 hours.

4,150,987
HYDRAZONE CONTAINING CHARGE TRANSPORT ELEMENT AND PHOTOCONDUCTIVE PROCESS OF USING SAME

Howard W. Anderson, Boulder, and Michael T. Moore, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

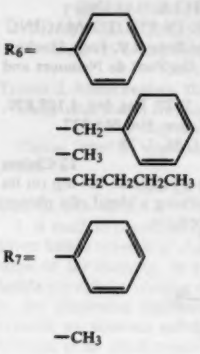
Filed Oct. 17, 1977, Ser. No. 842,431
Int. Cl.[2] G03G *5/14, 5/04*
U.S. Cl. 96—1.5 R **21 Claims**

1. A electrophotographic element comprising;
an electrically conductive layer;
a charge generation layer responsive to actinic radiation to generate an electron-hole pair; and
a p-type charge transport layer adjacent the charge generation layer, the charge transport layer comprising a hydrazone of the composition;



R_2=—OCH_2CH_3
—CH_3
—H

-continued



and a polymeric binder;
whereby holes generated by photoelectric phenomenon in the charge generation layer may be transported through the charge transport layer to facilitate localized selective discharge of charged surfaces of the element.

4,150,988
METHOD OF PHOTOPOLYMERIZING POLYMERIZABLE COMPOSITIONS CONTAINING GROUP Va ONIUM SALTS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 638,993, Dec. 9, 1975, Pat. No. 4,069,056, which is a continuation of Ser. No. 466,376, May 2, 1974, abandoned. This application Sep. 30, 1977, Ser. No. 838,154
Int. Cl.[2] G03C *5/00, 1/94, 1/68;* **C08F** *2/46*
U.S. Cl. 96—35.1 **2 Claims**

1. A method which comprises
(1) mixing a cationically polymerizable organic material free of oxirane oxygen with an effective amount of a radiation sensitive Group Va onium salt having the formula,

$$[(R)_a(R^1)_b(R^2)_cX]^+[MQ_d]^{-(e-f)},$$

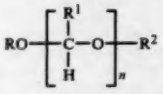
where
R is a monovalent aromatic organic radical selected from carbocyclic radicals and heterocyclic radicals, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted derivatives thereof, R^2 is a polyvalent organic radical forming an aromatic heterocyclic or fused ring structure with X, X is a Group Va element selected from N, P, As, Sb and Bi, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 4 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 to 2 inclusive, and the sum of A+b+c is a value equal to 4 or the valence of X,
$d=e-f$,
f=valence of M and is an integer equal to from 2 to 7 inclusive,
e is f and is an integer having a value up to 8,
(2) applying the mixture onto a substrate, and
(3) exposing the mixture of (1) to ultraviolet radiation.

4,150,989
PHOTOSENSITIVE ARTICLE HAVING POLYALDEHYDES AND ITS USE IN PHOTOIMAGING

William J. Chambers, Wilmington, and Robert P. Foss, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

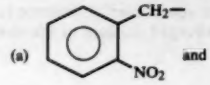
Division of Ser. No. 760,935, Jan. 21, 1977, Pat. No. 4,108,839.
This application Oct. 6, 1977, Ser. No. 841,827
Int. Cl.[2] G03C 5/00, 1/68, 1/78
U.S. Cl. 96—35.1 13 Claims

1. An imagable article comprising a substrate having on its surface a film of a composition comprising a blend of a photosensitive polyaldehyde having the formula:

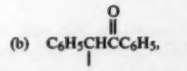


wherein

R is a photosensitive end group selected from



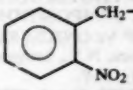
(a) and



(b)

R^1 is H or n-alkyl of 1–5 carbon atoms,

R^2 is (a) n-alkanoyl of 1–4 carbon atoms or (b) n-alkanoyl of 1–4 carbon atoms or



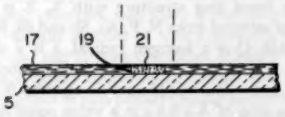
when R^1 is H, and

n is a positive integer of 10–4000 with a polymer capable of being cross-linked with aldehyde thermally released from the polyaldehyde.

4,150,990
SMALL PHOSPHOR AREA BLACK MATRIX FABRICATING PROCESS

John W. Stetz, Waterloo, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 10, 1978, Ser. No. 868,453
Int. Cl.[2] G03C 5/16; B05D 5/06
U.S. Cl. 96—36.1 15 Claims



1. In a cathode ray tube having a viewing panel with an inner surface, a multiple-apertured mask spaced from said inner surface, and a screen structure with a multitude of phosphor receiving areas smaller than said apertures of said mask interconnected by a webbing of opaque material affixed to said inner surface, a screen structure fabricating process comprising the steps of:

coating said inner surface of said viewing panel with a photo-sensitive resist material to provide a first film capable of solubility alteration upon exposure to actinic radiation;

exposing said first film to actinic radiation directed through said apertured mask to provide insoluble film areas of a given size interconnected by a webbing of soluble film;

depositing a coating of resist material over said first film and drying to provide a second film adhered to said first film;

removing said second film, said soluble portions of the first film and portions of said insoluble areas of said first film to provide insoluble areas of said first film of a size smaller than said given size and interconnected by a bare inner surface of said viewing panel;

overcoating said bare inner surface of said viewing panel and said insoluble areas smaller than said given size of said first film with a third film of opaque material;

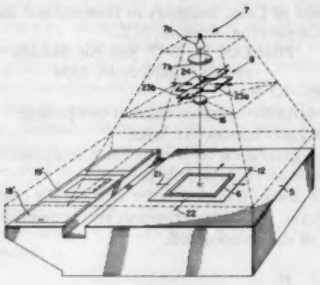
removing said insoluble areas smaller than said given size of said first film and said overcoating of said third film of opaque material thereon to leave an interconnecting web of opaque materials; and

depositing phosphor materials on said areas of a size smaller than said given size intermediate said web of opaque materials.

4,150,991
METHODS FOR PROVIDING TRANSPARENT ORIGINALS FOR PRINTING PLATE PRODUCTION OR FOR DIRECT PRODUCTION OF PRINTING PLATE

Brian St. P. Dillow, Stockholm, Sweden, assignor to Misomex Aktiebolag, Hägersten, Sweden

Filed Jan. 26, 1976, Ser. No. 652,168
Claims priority, application Sweden, Apr. 30, 1975, 7505084
Int. Cl.[2] G03C 5/04, 5/06
U.S. Cl. 96—41 6 Claims



1. A method for the preparation of a transparent original containing both text and images for use in the production of printing forms and plates comprising the steps of preparing a reproducible text on a surface wherein the text is arranged according to a predetermined layout in which areas are provided for the images and the layout is registered with respect to a correlating grid, preparing a unitary image film containing a plurality of images thereon, each of said images having any desired size without any predetermined relationship to the size of the image areas provided in the layout and said images being arranged in any desired order without any predetermined relationship to the relative locations of the image areas provided in the layout and registered with respect to said correlating grid, defining the respective locations and sizes of said areas with at least two pairs of first position coordinates correlated to said correlating grid and defining the respective locations of said images with at least one pair of second position coordinates correlated to said correlating grid, exposing a light

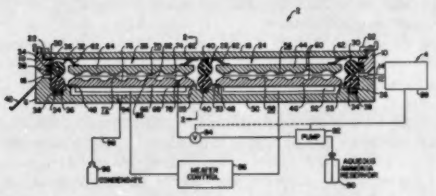
sensitive collection film wih the reproducible text such that exposure of portions of said collection film corresponding exclusively to the images and to any special text parts which are to be printed in a different color is prevented, automatically positioning the image film with respect to the collection film by calculating the coordinate relationship between the corresponding ones of said first and second pairs of position coordinates so as to align at least one of the images with the unexposed area provided therefor on the collection film, exposing the at least one image onto the collection film by lighting the at least one image with a sharply defined light beam which is automatically sized in dependence on the corresponding pairs of said first position coordinates so as to fall within the area of the collection film intended for the at least one image.

4,150,992

HIGH SPEED, LOW TEMPERATURE AND PRESSURE DIAZO PROCESSING METHOD

John W. Meadows, Los Altos, and Robert J. Ritter, Mountain View, both of Calif., assignors to Quantor Corporation, Mountain View, Calif.

Filed Dec. 27, 1977, Ser. No. 862,720
Int. Cl.[2] G03C *1/52, 1/58, 1/64;* G03D *13/00*
U.S. Cl. 96—49 **20 Claims**



1. A method for developing exposed diazo film having a substrate, an emulsion carried on a side of the substrate, and a given width and thickness, the method comprising the steps of: placing the film in a chamber having a height and a width which are only slightly larger than the thickness and the width, respectively, of the film; introducing aqueous ammonia vapor into the chamber at a pressure not substantially greater than atmospheric pressure so that the ammonia vapor contacts the film emulsion; and removing the film from the chamber after no more than a few seconds.

4,150,993

PROCESS FOR FORMING A DIRECT POSITIVE IMAGE

Tsuneo Suga; Keiji Ogi, and Kenji Egami, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,103
Claims priority, application Japan, Nov. 25, 1976, 51/142026
Int. Cl.[2] G03C *5/24*
U.S. Cl. 96—64 **7 Claims**

1. A process for forming a direct positive image by developing, after imagewise exposure of an internal latent image type light-sensitive silver halide photographic material, with a surface developer for silver halide, which comprises incorporating at least one fogging agent selected from hydrazine compounds, N-substituted cycloammonium salts and benzimidazole derivatives in combination with an amineborane compound into said light-sensitive silver halide photographic material, said surface developer or a treating bath used prior to the treatment by said surface developer.

4,150,994

PROCESS FOR THE MANUFACTURE OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING SILVER HALIDE CRYSTALS OF THE TWINNED TYPE

Trevor J. Maternaghan, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 20, 1977, Ser. No. 799,040
Claims priority, application United Kingdom, Jun. 10, 1976, 24001/76
Int. Cl.[2] G03C *1/02, 1/28*
U.S. Cl. 96—94 R **21 Claims**

1. A method of preparing a silver halide emulsion containing silver halide crystals of the twinned type which comprises the steps of (a) forming, in a colloid dispersing medium silver, halide crystals containing at least 90 mole % iodide, (b) mixing in the dispersing medium containing the said silver halide crystals an aqueous solution of a silver salt and a aqueous solution of an alkali metal or ammonium bromide or chloride or mixtures thereof so forming twinned silver halide crystals containing iodide and the halide being added, (c) adding a silver halide solvent to the dispersing medium and so causing the growth of the twinned crystals by Ostwald ripening and optionally (d) then causing the twinned crystals to increase in size by adding to the colloidal dispersion further aqueous silver salt solution and further alkali metal or ammonium halide and then finally optionally (e) removing the water-soluble salts formed and chemically sensitising the emulsion.

4,150,995

VITREOUS ENAMEL COMPOSITION CONTAINING PALLADIUM POWDER

Yukikazu Moritsu, Nishinomiya; Kooji Yamada, Kashihara; Masatoshi Wada, Izumiotsu, and Eiji Munemoto, Hirakata, all of Japan, assignors to Okuno Chemical Industry Co., Ltd., Japan

Filed Nov. 23, 1977, Ser. No. 854,397
Int. Cl.[2] C23C *3/02;* C03C *5/00, 17/04*
U.S. Cl. 106—1.21 **7 Claims**

1. A vitreous enamel composition comprising 1 part by weight of a vitreous enamel solid component composed of (1) 90–99.9 wt. % of glass powder consisting of 30 to 70 wt. % of SiO_2, 1–65 wt. % of Pb0, and 1–15 wt. % of R_2O in which R is K, Na or Li, and (2) 0.1–10 wt. % of palladium powder, and 3–20 parts by weight of an organic vehicle.

4,150,996

LITHOGRAPHIC FOUNTAIN CONCENTRATE

Leonard J. Druker, St. Paul, and Robert B. Kincaid, Bloomington, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 5, 1977, Ser. No. 822,267
Int. Cl.[2] C09K *3/18*
U.S. Cl. 106—2 **10 Claims**

1. A fountain concentrate which when diluted with water is capable of providing an acidic fountain solution for lithography, said concentrate consisting essentially of a mixture of sulfanilic acid, formaldehyde, and a desensitizer.

4,150,997

WATER BASE FLUORESCENT INK FOR INK JET PRINTING

Larry J. Hayes, Bartonville, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Apr. 24, 1978, Ser. No. 899,620
Int. Cl.[2] C09D *5/14, 11/02*
U.S. Cl. 106—15.05 **20 Claims**

1. A fluorescent ink composition for ink jet printing comprising an aqueous solution of approximately 10% to 20% by weight of fluorescent pigment rendered soluble by a sufficient amount of base to produce a pH of between 7.5 and 8.5, and of 2-(2-Butoxyethoxy)ethanol within the range of 3 to 20% by

weight, the ink composition having a viscosity within the range of 1.0 to 0.10 centipoise.

4,150,998

ROTARY SEALANT ABRADABLE MATERIAL AND METHOD FOR MAKING

Charles R. Morelock, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,931
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—44 4 Claims

1. A method for making a shaped abradable mass useful as a rotary sealant comprising

(1) mixing together by weight from 60% to 80% of silicon powder having an average particle size with 20% to 40% of carbon fiber having a length to diameter ratio with average value of from 1 to 20 and from 5% to 20% of an organic binder based on the weight of mixture,

(2) shaping the mixture of (1) under heat and a pressure of up to 2000 psi to produce a preform and

(3) molding the preform of (2) under reduced pressure at a temperature in the range of 1500° C. to 1800° C.

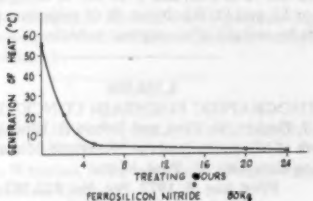
4. Rotary sealant material which is readily machinable and has a density of from 1.1 to 1.3, comprising the reaction product of 20% to 40% by weight of carbon fiber whose length to diameter ratio has an average value of from 1 to 20 and 60% to 80% by weight silicon powder having an average diameter of from 25 microns to 200 microns.

4,150,999

METHOD FOR MANUFACTURE OF FERROSILICON NITRIDE

Sadayuki Iwamoto, Omuta, Japan, assignor to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 603,920, Aug. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,832, Aug. 12, 1974, abandoned. This application Jun. 1, 1978, Ser. No. 911,420
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—73.5 2 Claims



1. A method for treating ferrosilicon nitride having a silicon nitride content of about 65% to 85% by weight, and containing impurities, including iron or unreacted ferrosilicon, which impurities will react exothermically with water, which comprises blending 100 parts by weight of the ferrosilicon nitride powder with an effective amount up to 100 parts by weight of an aqueous medium containing an additive at a concentration up to 30% by weight of the water, said additive being selected from the group consisting of hydrochloric, sulfuric, nitric, phosphoric, dichromic, chromic, acetic, formic, oxalic, tartaric and citric acids; sodium chloride, aluminum phosphate, ferric chloride, ferric sulfate and aluminum sulfate, and forcing a mixture of air and steam through the blend at a rate to maintain the blend temperature at about 50° to 150° C., whereby said impurities are oxidized and the treated ferrosilicon nitride is substantially stablized as to exothermic reaction with water.

4,151,000

ANHYDRITE BINDER AND METHOD

Roland Bachelard, Lyons; Robert Barral, Saint Symphorien; Maurice Lamalle, Saint-Genis-Laval, and Robert Koeppel, Bron, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 756,861, Jan. 4, 1977, abandoned. This application Mar. 30, 1978, Ser. No. 891,836
Claims priority, application France, Jan. 13, 1976, 76 00678
Int. Cl.[2] C04B *11/06*
U.S. Cl. 106—109 7 Claims

1. An anhydrite binder consisting essentially of particulate anhydrous $CaSO_4$ having an insoluble $CaSO_4$ content of at least 93%, an average particle size diameter of 5 to 30μ with at least 15% by weight of the particles having a diameter smaller than 10μ and at least 20% by weight of the particles having a diameter larger than 20μ, and a pore volume of less than 0.29 cc/g for pores having a radius less than about 6.6μ.

4,151,001

BEESWAX SUBSTITUTES

Gilbert L. Anderson, Jr., Wyncote, Pa., and Frederick P. Siegel, Lincolnwood, Ill., assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 11, 1977, Ser. No. 841,261
Int. Cl.[2] C08L *91/06*
U.S. Cl. 106—270 17 Claims

1. A composition useful as a substitute for natural beeswax comprising, a reaction product obtained by reacting, under esterification conditions,

(a) a difunctional aliphatic acid having from about 7 to about 36 carbon atoms;

(b) an aliphatic alcohol having from about 10 to about 22 carbon atoms; and

(c) a glycolic compound selected from the group consisting of ethylene glycol, propylene glycol, polyoxyethylene glycol having a molecular weight from about 100 to about 1500, and polyoxypropylene glycol having a molecular weight from about 150 to about 1025;

the reactants being present in an amount such that the number of acid functionalities is approximately equal to the number of hydroxyl functionalities; the alcohol and glycolic compounds each supplying at least 10 percent of the hydroxyl functionalities present; and the reaction being continued until the reaction mixture has attained an acid value from about 10 to about 30.

4,151,002

TALL OIL PITCH BASED THERMOPLASTIC ADHESIVE

Henry H. Fang, Mount Royal, Canada, assignor to Northwood Mills Ltd., Toronto, Canada

Filed Jul. 11, 1977, Ser. No. 814,628
Int. Cl.[2] C08L *93/00, 97/02*
U.S. Cl. 106—123 TQ 10 Claims

1. A thermoplastic adhesive essentially consisting of a reaction product of tall oil pitch with an organic anhydride having an ethylenic linkage in a α,β position, flanked by carbonyl groups, saponified with a multivalent metal hydroxide.

4,151,003

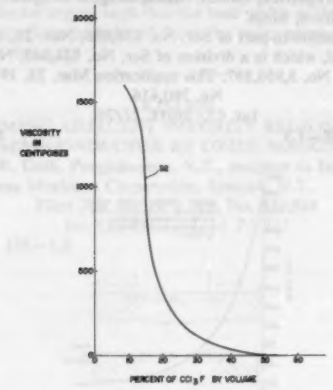
VISCOSITY MODIFICATION OF BITUMINOUS MATERIALS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Syracuse, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,619
Int. Cl.[2] C08L *95/00*
U.S. Cl. 106—278 11 Claims

1. A stable plastic or flowable composition consisting essentially of a viscous bituminous material in stable solution in a non-azetropic, non-flammable, non-toxic viscosity modifier which is a liquid at a temperature of 75° F. and ambient pressure, said viscosity modifier being essentially free of aqueous fluids, emulsifiers, and propellant gases and consisting of tri-

chlorofluoromethane alone or in admixture with at least one of the group consisting of dichlorodifluoromethane, monochlorotrifluoromethane, tetrafluoromethane, monochlorodifluoromethane, trichlorotrifluoroethane, dichlorotetrafluoroethane, and tetrachlorodifluoroethane in an amount effective to produce a reduction in the viscosity of the bituminous material at ambient pressures and temperatures.

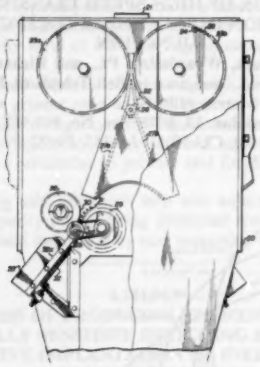


4,151,004

SUGARCANE PROCESSING EQUIPMENT

Branko Vukelic, 740 Kennedy Dr. W., Windsor, Ontario, Canada

Filed Oct. 17, 1977, Ser. No. 843,143
Claims priority, application Canada, Dec. 10, 1976, 267626
Int. Cl.[2] C13C *1/02, 1/04, 1/08*
U.S. Cl. 127—2 **5 Claims**



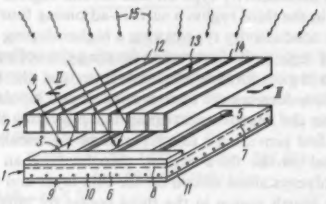
1. A sugarcane pith and rind separation unit comprising:
(a) a power driven rind gripping roll;
(b) a power driven pith milling roll positioned in close parallel spaced relation to the rind gripping roll;
(c) said rolls having surface indentations and being adapted to be driven at such rotational speeds as to accept incoming longitudinally split sugarcane stalk halves, flatten them, and mill out the pith away from the rind;
(d) a pith deflecting plate having surface for causing the rind and the separated pith to travel further on separate paths; and
(e) a rotating deflector in the form of an elongated cylindrical roller of relatively small diameter positioned adjacent the leading edge of the said plate and closely in the output side of the pinch between the said rolls and adapted to be driven at a rotational speed in relation to the said rolls such as to move any fibrous material that might otherwise collect and cause clogging and binding out of the confined region between the rolls and the deflecting plate and pass to the output.

4,151,005

RADIATION HARDENED SEMICONDUCTOR PHOTOVOLTAIC GENERATOR

Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17; Vitaly V. Zadde, poselok Severny, 9, linia, 3, kv. 120; Vadim A. Unishkov, ulitsa Bazhova, 15, korpus 1, kv. 162; Tatyana A. Litsenko, ulitsa Trubnaya, 11, kv. 12, all of Moscow, U.S.S.R.; Arkady P. Landsman, deceased, late of Moscow, U.S.S.R., by Olga V. Nekljudova, administratrix, Rizhsky proezd, 3, kv. 140, Moscow, U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,007
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 CC **18 Claims**

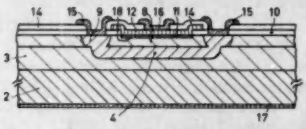


1. A semiconductor photovoltaic generator comprising:
at least one photovoltaic converter which converts incident radiation into electricity, said photovoltaic converter including an operating surface to receive said incident radiation,
a base region having one type of conduction due to majority current carriers present in said base region,
an inversion region having an opposite type of conduction due to minority current carriers present in said base region,
a rectifying barrier separating said base region with one type of conduction from said inversion region with the opposite type of conduction;
at least two current collector contacts,
one of said current collector contacts being connected to said base region, and another of said current collector contacts being connected to said inversion region;
a protection cover, through which said photovoltaic converter receives at least the photoactive part of the spectrum of said incident radiation which protects said photovoltaic converter from radiation which is damaging to said converter,
said protection cover including a receiving surface which receives said incident radiation, said cover further comprising:
a set of elements located adjacent to one another at least near said receiving surface made of a first material which transmits at least the photoactive part of the spectrum of said incident radiation to said operating surface of said photovoltaic converter; and
intermediate layers located between said adjacent elements of said protection cover made of a second material which serves to absorb the radiation which is damaging to said photovoltaic converter.

4,151,006
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Hendrik C. De Graaff; Paul A. H. Hart; Albert Schmitz, and Jan W. Slotboom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1977, Ser. No. 788,732
Claims priority, application Netherlands, Apr. 27, 1976, 7604445
Int. Cl.[2] H01L *29/72, 21/265*
U.S. Cl. 148—1.5 13 Claims

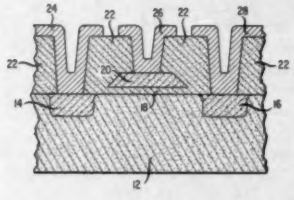


1. A method of manufacturing a semiconductor device having a bipolar transistor, the method including the steps of providing a semiconductor body having a first region of a first conductivity type, providing a second region of the second conductivity type on said first region, providing a third region of the first conductivity type on said second region, and then providing in the third region a surface-adjoining fourth region of the first conductivity type having a higher doping than that of the third region, the first region forming the collector zone, the second region forming the base zone, and the third and fourth regions forming the emitter zone of said bipolar transistor, wherein the improvement comprises providing the fourth region by first providing a thin layer of an electrically insulating material on the third region, then forming an undoped layer of polycrystalline silicon on the thin layer and then providing the fourth region in the third region by introducing a dopant through the polycrystalline silicon layer and the thin layer, the thickness of said thin layer being at least about 0.0010 micron and at most about 0.0100 micron.

4,151,007
HYDROGEN ANNEALING PROCESS FOR STABILIZING METAL-OXIDE-SEMICONDUCTOR STRUCTURES

Hyman J. Levinstein, Berkeley Heights, and Ashok K. Sinha, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 11, 1977, Ser. No. 840,620
Int. Cl.[2] H01I *7/54*
U.S. Cl. 148—1.5 11 Claims

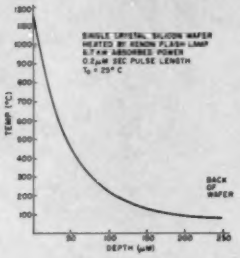


1. In a process of fabricating a semiconductor device, the device comprising a semiconductor substrate having a major surface which is at least partially covered by a layer of silicon dioxide, the last fabrication step in the process which is performed at temperatures of 600 degrees C. or greater being the step of heating the semiconductor device in an ambient of hydrogen gas at a temperature in the range of 650 degrees C.≦T≦950 degrees C.

4,151,008
METHOD INVOLVING PULSED LIGHT PROCESSING OF SEMICONDUCTOR DEVICES

Allen R. Kirkpatrick, Lowell, Mass., assignor to Spire Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 636,055, Nov. 28, 1975, abandoned, which is a division of Ser. No. 524,062, Nov. 15, 1974, Pat. No. 3,950,187. This application Mar. 23, 1977, Ser. No. 780,416
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 5 Claims



1. A method for localized thermal processing of a selected surface region of a semiconductor comprising the steps of:

(a) generating short duration, noncoherent pulsed light;

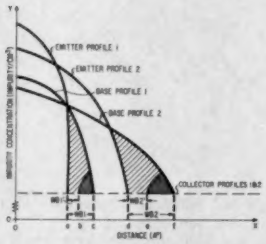
(b) directing said short duration pulsed light at the selected surface region of the semiconductor, said short duration, noncoherent pulsed light interacting with the selected surface region; and

(c) momentarily elevating temperature only in a vicinity of the selected region by impacting said short duration, noncoherent light pulse upon the selected surface region.

4,151,009
FABRICATION OF HIGH SPEED TRANSISTORS BY COMPENSATION IMPLANT NEAR COLLECTOR-BASE JUNCTION

Frank M. Ogureck, Wyomissing, Pa., and Richard S. Payne, Piscataway, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1978, Ser. No. 869,167
Int. Cl.[2] H01L *21/265, 29/72*
U.S. Cl. 148—1.5 3 Claims



3. A method of fabricating a bipolar transistor having a base width which is narrower than can be reproducibly fabricated in manufacture using standard diffusion or ion implantation techniques comprising the steps:

forming in a portion of the collector of one conductivity type a base region of opposite conductivity type using diffusion or ion implantation techniques;

forming in a portion of the base region an emitter region having the same conductivity as the collector region using diffusion or ion implantation techniques; and

characterized by the step of:

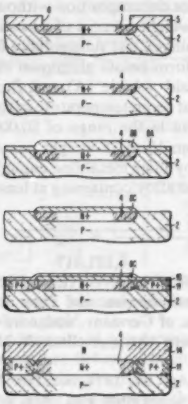
ion implanting into a portion of the base region near the base-collector junction an impurity that converts that portion of the base region to the same conductivity as the collector region such that the base width of the transistor is significantly reduced from the value attained prior to this step.

4,151,010

FORMING ADJACENT IMPURITY REGIONS IN A SEMICONDUCTOR BY OXIDE MASKING

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,924
Int. Cl.[2] H01L *21/26, 21/225*
U.S. Cl. 148—1.5 23 Claims



1. A method for introducing impurities into a region adjacent a first N type impurity region in a silicon semiconductor substrate, said adjacent region being either a N type region of lower impurity level or a P type region, comprising the steps of:

oxidizing said substrate to create a mask having a thickness which is greater over said first impurity region than over said adjacent region; removing a portion of said masking layer sufficient to re-expose said adjacent region, but leaving a remainder to protect said first impurity region; and

introducing said impurities into said adjacent region, said first impurity region being protected from the introduction of said impurities by said remaining masking layer.

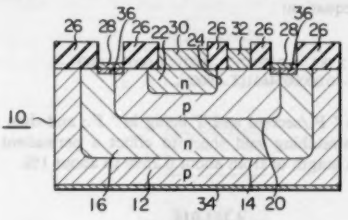
4,151,011

PROCESS OF PRODUCING SEMICONDUCTOR THERMALLY SENSITIVE SWITCHING ELEMENT BY SELECTIVE IMPLANTATION OF INERT IONS IN THYRISTOR STRUCTURE

Yutaka Mihashi; Josuke Nakata; Toshio Sogo, and Kenichi Yamanaka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1978, Ser. No. 924,830
Claims priority, application Japan, Jul. 15, 1977, 52-85432
Int. Cl.[2] H01L *21/265, 23/56*
U.S. Cl. 148—1.5 9 Claims

1. A process of producing a semiconductor thermally sensitive switching element having at least one pnpn thyristor structure in a semiconductor substrate, including a pn junction exposed to one main face of said semiconductor substrate and reversely biased in an OFF state of the element, and shifted from its OFF to its ON state in response to a rise in temperature which process comprises the steps of disposing a first implantation control film on at least a portion of said main face of said semiconductor substrate having said pn junction exposed thereto while disposing a second implantation control film on the remaining portion of said main face, said first implantation control film having a low penetration stopping capability to implanted ions, said second implantation control film having high penetration stopping capability to said implanted ions, and implanting ions of an element with a predetermined implantation energy into said semiconductor substrate through said first and second implantation control films to form a semiconductor region including lattice defects only in a portion of said semiconductor substrate overlaid with said first implantation control film.



4,151,012

HIGH STRENGTH, CORROSION RESISTANT TUBULAR PRODUCTS AND METHODS OF MAKING THE SAME

Ales Simkovich, Ligonier Township, Westmoreland County, and Leonard A. Pugliese, Murrysville, both of Pa., assignors to Latrobe Steel Company, Latrobe, Pa.

Filed Apr. 11, 1977, Ser. No. 786,491
Int. Cl.[2] C21D *9/14*
U.S. Cl. 148—11.5 N 18 Claims

1. A non-laminar tubular metal product for use in sour gas wells characterized by resistance to hydrogen sulfide embrittlement at temperatures up to about 600° F., the entire product consisting essentially of an alloy having the composition up to about 0.035% maximum carbon, up to about 0.15% maximum silicon, up to about 0.15% maximum manganese, up to about 0.010% maximum sulfur, up to about 0.015% maximum phosphorus, about 19.0% to about 21.0% chromium, about 33.0% up to 37.0% nickel, about 9.0% to about 10.5% molybdenum, up to about 1.0% titanium, up to about 0.015% boron, up to about 2% iron and the balance cobalt, said tubular product having been subject to explosive shock strengthening treatment to effect non-directional cold working of the entire body of the tube.

4,151,013

ALUMINUM-MAGNESIUM ALLOYS SHEET EXHIBITING IMPROVED PROPERTIES FOR FORMING AND METHOD ASPECTS OF PRODUCING SUCH SHEET

David S. Thompson; John S. Prestley, Jr., and Thomas E. Webb, all of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 812,818, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 746,168, Nov. 30, 1976, abandoned, which is a continuation of Ser. No. 624,612, Oct. 22, 1975, abandoned. This application Feb. 10, 1978, Ser. No. 876,577
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—11.5 A 14 Claims

1. In processing cold rolled, work-hardened sheet, said sheet being further characterized by its alloy composition consisting essentially of aluminum and from about 2 to about 8% magnesium by weight and by its work-hardened state corresponding to having been cold rolled to effect a thickness reduction of at least 40%, the method of rendering said sheet in a highly formable finished condition wherein the finished sheet will

form free from Type A Luder lines when strained from about ¼% to about 2.5%, which comprises the following steps:

heating said sheet to a temperature T in the range of from about 850° F. to about 1050° F; then

quenching said sheet down to about 350° F. in temperature at a rate of at least about Q, and at most about 9000° F./Second, where Q is ascertained according to the following equation:

$$\text{Log}_{10}(Q)=2.785-0.030657(T-900)+0.00053144(T-900)^2-0.0000074631(T-900)^3,$$

Q being in ° F./second and T being in ° F.; and then uniformly stretching said sheet to effect a permanent set along its length of from about 0.25% to about 1%.

4,151,014

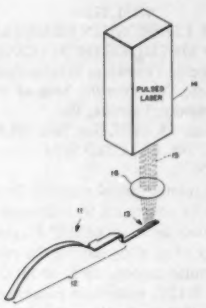
LASER ANNEALING

Sidney S. Charschan, Middletown Township, Bucks County, Pa., and Edward S. Tice, Mercerville, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 31, 1977, Ser. No. 801,666

Int. Cl.² C22F *1/00*

U.S. Cl. 148—13 **8 Claims**



1. A method of annealing a selected portion of a hardened nonferrous, metallic workpiece to a controlled degree of intermediate temper, comprising the steps of:

(a) irradiating the selected portion of the hardened nonferrous, metallic workpiece with a pulsed laser beam; while

(b) so regulating a parameter of the pulsed laser beam as to effect said controlled degree of intermediate temper.

4,151,015

FLUX FOR USE IN SOLDERING

Robert N. Cooper, Skokie, Ill., assignor to Lake Chemical Company, Chicago, Ill.

Filed Dec. 2, 1977, Ser. No. 856,672

Int. Cl.² B23K *35/362*

U.S. Cl. 148—23 **12 Claims**

1. A water-soluble paste-form soldering flux composition having particular utility for the soldering of copper and copper-base alloy water lines, said flux composition consisting essentially of at least one surfactant selected from the class consisting of nonionic surfactants of the class of water-soluble ethylene oxide adducts and ethylene oxide-propylene oxide adducts and anionic water-soluble surfactants, said surfactants as such or in admixture in the flux composition being in the form of a paste, and a water-soluble organic amine hydrohalide in which the hydrohalide is selected from the group consisting of hydrochlorides, hydrobromides and hydrofluorides, said organic amine hydrohalide being present in a proportion of from about 2 to 80 weight % of said flux composition.

4,151,016

SINGLE COMPONENT BRAZING PASTE

Irene W. H. Lee, Willoughby, Ohio, assignor to Fusion Incorporated, Willoughby, Ohio

Continuation of Ser. No. 724,331, Sep. 17, 1976, which is a continuation-in-part of Ser. No. 625,655, Oct. 24, 1975. This application Apr. 19, 1978, Ser. No. 897,718

Int. Cl.² B23K *35/34*

U.S. Cl. 148—24 **11 Claims**

1. A brazing paste suitable for brazing aluminum, having excellent shelf-life and having a viscosity at room temperature in the range of 200,000 to 1,000,000 centipoises, said paste being a mixture consisting essentially of (A) from 7 to 35 weight percent of a non-aqueous vehicle which is substantially inert to the other components of said mixture, which has a viscosity at room temperature in the range of 30,000 to 100,000 centipoises and which at brazing temperature is capable of volatilization and/or decomposition without leaving a residue, (B) from 18 to 75 weight percent of a brazing flux suitable for use in brazing aluminum, and substantially free of any metals in free or combined form below aluminum in the electromotive series of metals, said vehicle (A) and flux (B) in a mixture having a viscosity at room temperature greater than the viscosity of (A) alone and in the range of 80,000 to 250,000 centipoises, and (C) from 15 to 75 weight percent of a particulate aluminum base alloy filler metal fine enough to pass through a 60 mesh screen, said alloy containing at least 88 weight percent aluminum.

4,151,017

METHOD OF PRODUCING HEAT-RESISTANT PARTS

Siegfried Helm, Petershausen, and Peter Leven, Allershausen, both of Fed. Rep. of Germany, assignors to Maschinenfabric Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 791,749

Claims priority, application Fed. Rep. of Germany, May 7, 1976, 2620197

Int. Cl.² B22F *3/24*

U.S. Cl. 148—126 **6 Claims**

1. A method of producing a part of heat-resistant material, comprising the steps of:

(a) forming a non-polymorphous metal-base part by means of a sintering operation,

(b) providing the part by vapor deposition with a skin formed of a non-polymorphous material having a melting point above the melting point of the material of which the part is formed, and

(c) heat treating the skin-bearing part in a gravity-free condition at a temperature near the melting point of the material of which the part is formed, the temperature being high enough to cause the material of the part to soften and to cause the part to contract but the temperature being below the melting point of the skin material so that the skin maintains the shape of the part during the heat treatment and the skin is under compressive stress due to contraction of the part.

4,151,018

DRILL PIPE MANUFACTURE

Jimmie B. Bolton, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 814,542, Jul. 11, 1977. This application Nov. 14, 1977, Ser. No. 851,037

Int. Cl.² C21D *1/66*

U.S. Cl. 148—127 **2 Claims**

1. In the manufacture of drill pipe, the method comprising

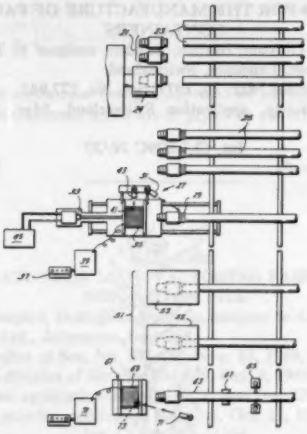
friction welding an alloy steel tool joint connector to one end of a seamless steel tube, thereby producing a weld at the juncture of the tube and connector,

moving the pipe to a tempering station, the weld cooling meanwhile in the air,

viewing the weld infrared radiation at the tempering station to determine the temperature of the weld area,

when the so determined temperature of the weld corresponds to 90% transformation from austenite to martensite, changing the relative positions of the pipe and an induction heating coil to place the coil around the weld coaxial with the pipe,

energizing the coil to reheat the weld,



again viewing the weld infrared radiation to determine the temperature of the weld,

when the last so determined temperature of the weld has reached a temperature below austenitizing but sufficient to temper the steel, deenergizing the induction coil and changing the relative positions of the pipe and coil to leave the pipe out of the coil,

machining the flash off of the weld, hardening the weld, and then tempering the weld.

4,151,019

METHOD OF MANUFACTURING INTEGRATED INJECTION LOGIC SEMICONDUCTOR DEVICES UTILIZING SELF-ALIGNED DOUBLE-DIFFUSION TECHNIQUES

Yukuya Tokumaru; Masanori Nakai; Satoshi Shinozaki; Junichi Nakamura; Shintaro Ito, and Yoshio Nishi, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

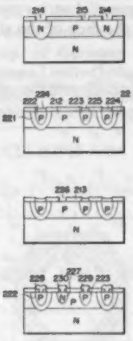
Division of Ser. No. 644,294, Dec. 24, 1975, Pat. No. 4,058,419. This application Aug. 5, 1977, Ser. No. 822,322

Claims priority, application Japan, Dec. 27, 1974, 49-148795; Dec. 27, 1974, 49-148796; Dec. 27, 1974, 49-148797; Dec. 27, 1974, 49-191375

Int. Cl.[2] H01L *21/22, 21/76, 27/04*

U.S. Cl. 148—175 **7 Claims**

1. A method of manufacturing an integrated injection logic semiconductor device comprising the steps of forming a semiconductor layer of the opposite conductivity type on a semiconductor substrate of one conductivity type; forming an insulation film on said semiconductor layer of the opposite conductivity type; forming first and second openings through said insulation film; doping an impurity of said one conductivity type into said semiconductor layer of the opposite conductivity type through said first opening in a nonoxidizing atmosphere thereby forming a first one conductivity type region reaching said semiconductor substrate; doping an impurity into said first region of the first conductivity type and said semiconductor layer of the opposite conductivity type through said first and second openings in an oxidizing atmosphere thereby forming first and second opposite conductivity type regions completely within said first one conductivity type region and said semiconductor layer of the opposite conductivity type respectively; forming a third opening through said insulation film; and doping an impurity of said one conductivity type into



said selected portion of the semiconductor layer of the opposite conductivity type through said third opening thereby forming a second one conductivity type region.

4,151,020

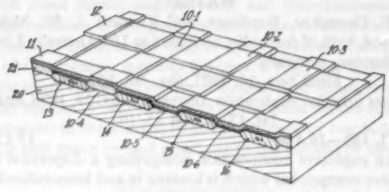
HIGH DENSITY N-CHANNEL SILICON GATE READ ONLY MEMORY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 26, 1977, Ser. No. 762,612

Int. Cl.[2] H01L *21/225, 21/26*

U.S. Cl. 148—187 **12 Claims**



1. A method of making a semiconductor device comprising the steps of masking a plurality of parallel elongated regions of a face of a semiconductor body against oxidation, growing thick field oxide in the spaces between the elongated regions but not above the elongated regions, removing small areas of the field oxide in a pattern according to where functioning transistors are to be created, forming thin gate dielectric in said small areas, and applying a plurality of parallel elongated conductive strips over the field oxide and gate dielectric in a direction normal to the elongated regions.

4,151,021

METHOD OF MAKING A HIGH DENSITY FLOATING GATE ELECTRICALLY PROGRAMMABLE ROM

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

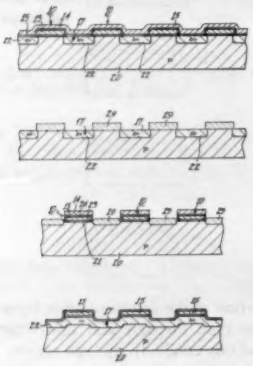
Filed Jan. 26, 1977, Ser. No. 762,613

Int. Cl.[2] H01L *21/225, 21/26*

U.S. Cl. 148—187 **14 Claims**

1. A method of making an electrically programmable floating gate nonvolatile semiconductor memory in the form of an array of rows and columns of memory cells, comprising the steps of: applying successive coatings of oxide, polycrystalline silicon and an oxidation mask to a face of a silicon body; pat-

terning said coatings to provide a plurality of parallel strips; oxidizing the face of the silicon body to produce field oxide in the areas between said parallel strips thicker than the oxide coating; patterning said coatings and the field oxide to provide a second plurality of parallel strips normal to the original parallel strips exposing the face of the silicon body; introducing conductivity-type determining impurity into the exposed silicon at said second plurality of parallel strips to provide column lines; providing an insulating coating over the face; and providing a pattern of parallel strips of polycrystalline silicon overlying the insulating coating and the original parallel strips to provide row lines.



4,151,022

IMMOBILIZED EXPLOSIVE COMPONENT IN FOAMED MATRIX

Paul F. Donaghue, Bundoora, and Kenneth A. W. Mitchell, Elwood, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 14, 1977, Ser. No. 851,384
Claims priority, application Australia, Nov. 29, 1976, 8310/76
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **17 Claims**

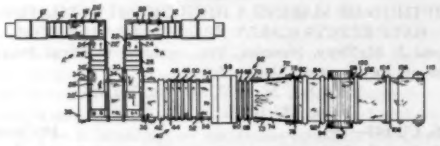
1. An explosive composition comprising a dispersion of an explosive component which is located in and immobilized by a solidified foamed non-explosive matrix.

4,151,023

METHOD FOR THE PRODUCTION OF A NONWOVEN FABRIC

Louis Platt, Seneca; Marvin Wishman, Greenville, both of S.C.; David R. Gentry, Chamblee, Ga., and Jake E. Williams, Rockwall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 610,899, Sep. 5, 1975, Pat. No. 4,042,655. This application Jun. 6, 1977, Ser. No. 804,196
Int. Cl.[2] B32B *27/02*; D04H *1/54*
U.S. Cl. 156—62.2 **5 Claims**



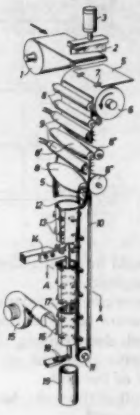
1. A method for fusing the fibers of a nonwoven batt of synthetic fibers having a longitudinal direction and a transverse direction wherein the depth of fusion is controlled and the integrity of the fibers' cross-section is maintained after fusion comprising subjecting at least one side of the batt to infrared radiation to melt and fuse the fibers together until the desired depth of fusion is obtained wherein the nonwoven batt comprises synthetic fibers oriented primarily in the transverse direction and the batt is subjected to tension in said transverse direction simultaneously with infrared irradiation.

4,151,024

METHOD FOR THE MANUFACTURE OF PACKING CONTAINERS

Ingemar W. Ohlsson, Malmo, Sweden, assignor to Tetra Pak Development, Lausanne, Switzerland

Filed Mar. 16, 1977, Ser. No. 777,942
Claims priority, application Switzerland, Mar. 31, 1976, 4020/76
Int. Cl.[2] B29C *24/20*
U.S. Cl. 156—69 **18 Claims**



1. A method for the manufacture of a tubular member from a heat-shrinkable material, said method comprising the steps of:

conveying a heat-shrinkable material past at least one heat source with at least a portion of a surface of the material which is intended to form an inner surface of the tubular member being adjacent said heat source;

heating at least one portion of said surface adjacent to said heat source sufficiently such that the material shrinks and acquires a tendency to assume a generally tubular shape;

assisting the material to assume the tubular shape with edges of the material overlapping one another;

heating the overlapping longitudinal edges sufficiently such that the material along the edges reaches sealing temperatures; and,

pressing the longitudinal edges together to form a tubular member having a tight and durable joint.

4,151,025

METHOD FOR WATERPROOFING BRIDGE DECKS AND THE LIKE

Melvin J. Jacobs, Sharon, Mass., assignor to Triram Corporation, Framingham, Mass.

Filed Jun. 6, 1977, Ser. No. 803,789
Int. Cl.[2] E04B *2/00*; E01D *19/12*; E01C *3/06*
U.S. Cl. 156—71 **19 Claims**

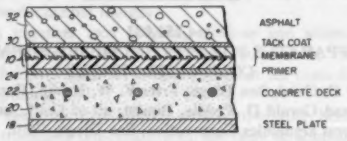
1. The method of waterproofing concrete bridge decks and the like, comprising the steps of

(a) applying a preformed heat softenable, waterproof, flexible sheet membrane over the upper surface of said deck,

(b) applying sufficient heat to said membrane to cause at

least that portion of said membrane against said deck to flow into binding adhesion with said deck, and

(c) applying a wear stratum over said membrane,



(d) said membrane being comprised of an upper ply of a cured elastomer and a lower ply of an uncured elastomer.

4,151,026

APPARATUS FOR MANUFACTURING FABRIC WITH NON-WOVEN PILE

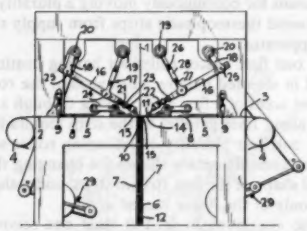
Jean J. Hospied, Dottignies, Belgium, assignor to A. F. Stoddard & Co., Ltd., Johnstone, Scotland

Continuation of Ser. No. 871,286, Nov. 13, 1969, abandoned, which is a division of Ser. No. 584,249, Oct. 4, 1966, abandoned. This application Jan. 24, 1972, Ser. No. 220,454

Claims priority, application Belgium, Oct. 11, 1965, 18931

Int. Cl.[2] D04H *11/04*

U.S. Cl. 156—435 **6 Claims**



1. In apparatus for producing non-woven pile fabric including means for passing a pair of support sheets in spaced, face-to-face relation to form a passageway therebetween, means for supplying at least one continuous flexible element to said passageway, means for repeatedly contacting the continuous element alternately with the opposing faces of the spaced sheets to position the element between and contiguous with the sheets in a generally sinuous path in the passageway and means for holding the continuous element on at least one of the faces while separating support sheets; the improvement wherein said means for contacting the element with the sheets comprises a pair of movable folding blades, one of said blades positioned generally on each side of said continuous element and adjacent the entry to the passageway, and means for directing each blade in a desired path toward and away from the respective opposed support sheet to engage and push the continuous element against the sheet, said directing means comprising a connecting rod supportingly attached to each blade, two suspension cranks for each connecting rod, an end of each of the two suspension cranks pivotally attached to the connecting rod at spaced points along its axis, means supporting the other ends of the suspension cranks for pivotal movement about spaced axes, and means for moving the suspension cranks and connecting rod attached to each blade to move the blade in a desired path toward and away from the face of one of the support sheets.

4,151,027

METHOD FOR THE RENEWAL OF A WORN PNEUMATIC OR SOLID RUBBERY TIRE BY APPLYING A VULCANIZED TREAD AND APPARATUS CARRYING OUT THIS METHOD

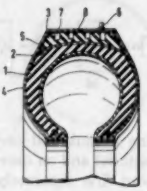
Wilhelm Schelkmann, and Gerda Schelkmann, nee Werner, both of Witten, Fed. Rep. of Germany Germany, assignors to Vakuum Vulk Holdings Limited, Nassau, The Bahamas

Filed Aug. 4, 1977, Ser. No. 821,731

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722134

Int. Cl.[2] B29H *5/04, 17/36*

U.S. Cl. 156—96 **23 Claims**



1. A method of retreading rubber tyres, said method comprising applying to a tyre carcass a prevulcanized tread with a vulcanizable bonding layer interposed therebetween, enclosing said tread and at least the adjacent part of said carcass with a flexible envelope and subjecting the resulting blank comprising said carcass, tread, and bonding layer, to a pressure- and heat-treatment in an autoclave and pressing the flexible envelope in to close fit with the tread at least at the outside parts of the road engaging surface to bond said tread to said carcass, pressurizing the bottom of the interstices between the projecting portions formed in the tread profile to avoid distortions of the profiled tread during said pressure- and heat-treatment by a pressure medium of the gaseous inclusions between the envelope and said blank or the fluid of the autoclave by effecting a flow of the pressure medium between a reservoir adjacent to the tyre blank and a space formed by said close fitting envelope and the bottom of said interstices of the tread by the action of the pressure in the autoclave in the absence of conduits connecting said space or said reservoir to the outside of the autoclave.

4,151,028

ALKANOLAMINE SALTS OF PHENOLIC RESINS

David C. Eaton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 21, 1978, Ser. No. 935,612

Claims priority, application United Kingdom, Aug. 19, 1977, 34902/77

Int. Cl.[2] B29H *5/02*; C08G *8/14, 8/22, 14/06*

U.S. Cl. 156—110 MD **7 Claims**

1. Salts of alkanolamines having alkanol residues of C_2 to C_3 and fusible substances having a molecular chain containing at least one each of the groups X—, —Y— and —Z, connected by methylene groups, a molecular weight of at least 300, melting in the range 10° to 300° C. and having a solubility of at least 1% by weight in N aqueous ammonia at 25° C., wherein X and Z are the same or different divalent radicals of resorcinol or substituted resorcinols and Y is a monovalent radical of a monobromo- or monochloro-monohydroxybenzene, an alkyl monohydroxybenzene wherein the alkyl group is C_1–C_5 or a dichloro-, dibromo- or C_1–C_5-dialkyl-monohydroxybenzene in which at least two of the 2, 4 and 6 positions, relative to the hydroxy group, are unsubstituted.

7. The use of a resorcinol-formaldehyde-latex (RFL) dip for coating polyester fibres in the formation of polyester fibre-reinforced rubber articles, characterised in that a salt as defined in claim 1 is added to the RFL dip or is applied to the polyester

fibre separately from an aqueous bath prior to contacting the fibre with the rubber.

4,151,029
METHOD OF MAKING TENNIS BALLS

James Jones-Hinton, Solihull, England, assignor to Dunlop Limited, London, England

Filed Apr. 13, 1976, Ser. No. 676,484
Claims priority, application United Kingdom, Apr. 30, 1975, 17942/75
Int. Cl.[2] A63B 39/06
U.S. Cl. 156—145 18 Claims

1. A method of making a tennis ball having an inner portion of flexible polymeric material and an outer surface thereon of fiberous material without first separately forming a hollow core, said method comprising the steps of:

forming laminated blanks of a layer of said flexible polymeric material and a layer of said fiberous material,

adhering together the edges of at least one of said laminated blanks to form a hollow closed body with said flexible polymeric material layer forming the inner surface of said body,

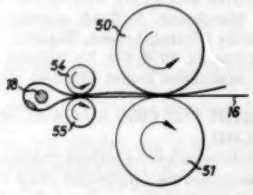
placing said hollow body in a mold whose interior surface has the configuration of the desired tennis ball, and

heating to conform said hollow body to said interior surface of the mold whereby a tennis ball is formed with a visible seam defining the junction between said adhered edges.

4,151,030
METHOD FOR JOINTING OF DIELECTRIC OPTICAL WAVEGUIDES

Paul C. Hensel, Suffolk, England, assignor to The Post Office, London, England

Filed Nov. 3, 1977, Ser. No. 848,331
Claims priority, application United Kingdom, Nov. 9, 1976, 46609/76
Int. Cl.[2] B65H 69/02; G02B 5/14
U.S. Cl. 156—158 10 Claims



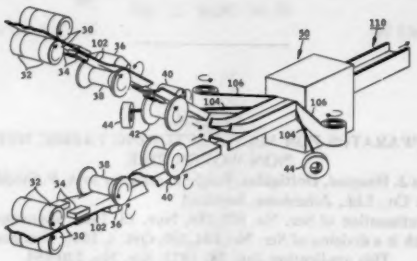
1. A method of forming a dielectric optical waveguide joint comprising the steps of providing an elongate tape having a first surface and a leading end, forming a loop in the elongate tape by overlapping said leading end to contact a portion of the first surface with itself, the loop having dimensions substantially greater than the cross-sectional dimensions of the waveguides to be jointed, inserting the ends of two dielectric optical waveguides into the loop so that their ends are separated by a small amount, thereafter reducing the size of the loop by moving the contacting portion of the first surface with itself toward the loop until the waveguides cannot be moved alongside one another, moving the ends of the waveguides into abutment, further reducing the size of the loop to tighten the loop around the waveguide ends and securing the tape around the waveguides.

10. A method according to claim 1 including cutting the contacted portions of the tape after the loop has been secured.

4,151,031
APPARATUS FOR CONTINUOUSLY FORMING COMPOSITE SHAPES

Robert C. Goad, San Diego; Fritz F. W. Krohn, Rancho Santa Fe, and Gerald D. Peddie, Bonita, all of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Jul. 5, 1977, Ser. No. 813,407
Int. Cl.[2] B32B 31/00
U.S. Cl. 156—201 5 Claims



1. An apparatus for continuously forming elongated structural shapes from fiber reinforced thermoplastic strips which comprises:

drive means for continuously moving a plurality of dry fiber reinforced thermoplastic strips from supply rolls through the apparatus;

at least one first heater roller set having heating means located in selected narrow rings around the roller surfaces to heat areas of a first strip passing through said roller set only along lines parallel to the strip longitudinal edges;

at least one first plurality of reshaping roller sets, each set having complimentary shapes for changing the cross-sectional shape of the first strip in steps, said reshaping occurring only in the linear heated areas;

means to continuously feed at least one second strip into contact with said first step;

consolidating heating means for receiving said first and second strips, including a first plurality of opposed spring-loaded platens to compress the contacting areas of said strips together to form a structural member and heating means to heat said strips to the consolidation temperature range of said thermoplastic as said strips move continuously through said first platens;

cooling means for receiving the resulting structural member from said consolidating heating means comprising a second plurality of opposed spring-loaded platens engaging said member to maintain the shape of said member and cooling means cooling said member to return said member to a temperature below the thermoplastic consolidation temperature range as said member moves continuously through said second platens.

5. A method of manufacturing a structural beam having an I-beam cross-section from strips comprising graphite fibers embedded in a thermoplastic resin matrix which comprises the steps of:

heating areas parallel to longitudinal edges of two graphite/-thermoplastic strips to the consolidation temperature range of the resin;

passing each of said strips through sets of rollers, each set having cooperating shapes which bend said strips along said heated areas to stepwise change the cross-section of each strip from rectangular to a channel section;

bringing the two resulting channel sections together in a

back-to-back relationship with the channel flanges in a planar relationship;

bringing two graphite/thermoplastic welts into contact with the outer line of contact between channel backs;

bringing two graphite/thermoplastic cap strips into contact with said channel flanges;

pressing together said channel sections and strips while heating them to the consolidation temperature range of said thermoplastic, for a time sufficient for consolidation and bonding; and

cooling said resulting I-beam to a temperature below the glass transition temperature of the resin structural shape while applying shape-maintaining pressure until the temperature is below the glass transition temperature of the thermoplastic.

4,151,032

APPARATUS AND METHOD FOR MANUFACTURING A PLASTIC CONTAINER HAVING PRINTED PAPER INSERT

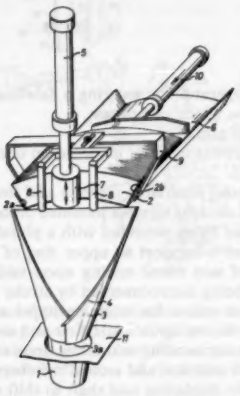
Friedrich Brummer, Dinkelsbuhl, Fed. Rep. of Germany, assignor to ESBE Plastics Dinkelsbuhl Brummer K.G., Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,377

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647238

Int. Cl.[2] B65C *3/08*

U.S. Cl. 156—215 **4 Claims**



1. A method of manufacturing a rounded container of the kind having inner and outer mating container wall parts of plastics with a printed paper segment interposed between said parts, comprising the steps of locating an outer container part at a paper insert station in alignment with the smaller open end of a tubular tapered guide, said smaller open end being of similar shape but smaller dimension than the mouth of the outer container part, feeding a said printed paper segment into the tapered guide and causing it to be moved along said guide whereby the segment is progressively shaped to correspond with the container, and causing the shaped insert to be fed through said smaller open end and into the outer container part, whereupon its resilience causes it to expand into contact with the inner surface of the side wall of the outer container part, and subsequently pressing an inner container part into the outer container part to sandwich the paper insert therebetween.

4,151,033

PRINTED TEXTILE WEB MATERIAL AND METHOD

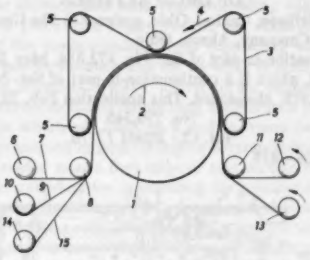
Gerhard Metzger, Haibach bei Aschaffenburg, Fed. Rep. of Germany, assignor to Transfertex Thermodruck-system GmbH, Kleinostheim, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,301

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643743

Int. Cl.[2] B44C *1/00*

U.S. Cl. 156—235 **3 Claims**



1. A method of making a web material, comprising the cooperative steps of bringing into contact with one face of a textile web of material a web of transfer paper and into contact with the other face a heat-activatable adhesive coated face of a backing web, and by applying heat and pressure to the contacting webs transferring a pattern to said one face of the textile web of material and bonding the backing web to the said other face of the textile web material.

4,151,034

CONTINUOUS GAS PLASMA ETCHING APPARATUS

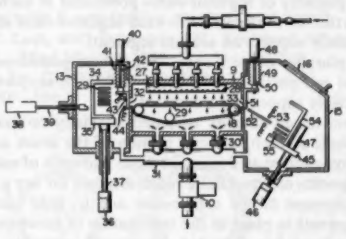
Shinichi Yamamoto; Yasusuke Sumitomo, both of Yokohama; Yasuhiro Horiike, Tokyo, and Masahiro Shibagaki, Hiratsuka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 19, 1977, Ser. No. 862,161

Claims priority, application Japan, Dec. 22, 1976, 51-153314

Int. Cl.[2] H01L *21/306*; C23F *1/00*

U.S. Cl. 156—345 **14 Claims**



1. A continuous gas plasma etching apparatus comprising a reaction chamber having an inlet means and an outlet means; an activation portion disposed at a distance from said reaction chamber; a distributor means for uniformly supplying said reaction chamber with an activated gas produced in said activation portion; an exhaust means for exhausting the gas inside said reaction chamber from a plurality of gas outlets; a conveyer means disposed inside said reaction chamber to transfer workpieces from the inlet means side to the outlet means side in said reaction chamber; a feeding chamber disposed on the inlet means side of said reaction chamber to contain the workpieces; a workpiece feeding means for feeding the workpieces in said feeding chamber to said conveyer means by means of said inlet means; a first shutter means for opening and shutting

said inlet means; a receiving chamber disposed on the outlet means side of said reaction chamber to receive the workpieces treated with said activated gas in said reaction chamber; a treated workpiece delivering means for introducing the treated workpieces in said reaction chamber into said receiving chamber through said outlet means; and a second shutter means for opening and shutting said outlet means.

4,151,035

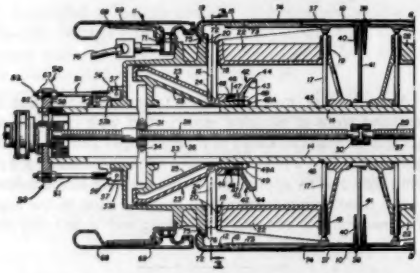
BUILDING MACHINE HAVING AN INFINITE NUMBER OF DRUM SETTINGS

Frank R. Jellison, Canton, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 472,314, May 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 606,142, Aug. 20, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,345

Int. Cl.[2] B29H *17/16*

U.S. Cl. 156—415 **6 Claims**



1. A tire building machine having:

A. a building drum of substantially cylindrical shape and of uniform diameter during expansion and contraction having an infinite number of diameter and length settings adapted for building at least a portion of a pneumatic tire thereon;

B. a hollow spindle for rotatably mounting the drum axially thereon;

C. a plurality of arcuate segments positioned about the drum at opposite axial end portions of the drum to define at least a part of the cylindrical surface of the drum;

D. a plurality of segment stems positioned in each said end portion of the drum with each segment stem adapted to radially support an arcuate segment;

E. a plurality of stem support members positioned in each said end portion of the drum with each support member slidably supporting a segment stem;

F. cam means slidably mounted coaxially on said hollow spindle at each said end portion of the drum adapted to move each of said segment stems and each of said arcuate segments an equal finite radial distance for any given axial movement of the cam means and to hold said arcuate segments in place at the termination of movement;

G. at least one threaded drive shaft rotatably mounted within said hollow spindle adapted to move said cam means axially on rotation of said shaft to any position on a predetermined length of said shaft;

H. power means mounted adjacent said drive shaft for rotationally driving said drive shaft any number of revolutions or portions thereof within a predetermined range;

I. a clutch-brake mechanism attached to said power means for rotation of spindle and drive shaft in unison or for rotation of drive shaft independently of said spindle;

J. a shoulder frame in each end portion of the building drum slidably fastened axially on said spindle to lengthen or shorten said building drum, said frame supporting said stem support members;

K. turn-up bladders supported by said shoulder frame positioned adjacent said end portions outwardly of said building drum;

L. tie rod means capable of rigidly fastening the shoulder frame relative to said spindle while leaving the cam means axially slidable on the spindle to provide for an infinite number of controlled drum diameter settings and while retaining a fixed drum length;

M. means capable of fastening the cams means relative to said shoulder frame to provide for an infinite number of controlled drum lengths.

4,151,036

APPARATUS FOR THE APPLICATION OF A FABRIC COVERING THE FRAME OF A LAMPSHADE

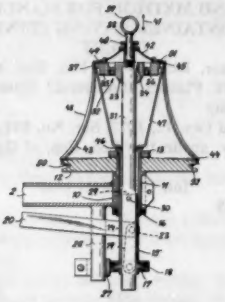
Paul M. David, St-Marcellin, and Bernard H. E. Rey, St-Sauveur, both of France, assignors to Redalum, Societe Anonyme, Teche, France

Filed Oct. 13, 1977, Ser. No. 841,847

Claims priority, application France, Oct. 13, 1976, 76 31315

Int. Cl.[2] B29C *17/02*

U.S. Cl. 156—475 **18 Claims**



1. An apparatus for securing a fabric covering to a lampshade frame which comprises:

a support arm;

a first circular member mounted on one end of said support arm;

a shaft axially shiftable through said first member;

a second circular member mounted on said shaft, said second member being provided with a plurality of pivotal cleats adapted to support an upper ring of said frame, a lower ring of said frame resting upon said first member, said rings being interconnected by struts;

respective means for retaining upper and lower ends of a fabric sleeve against said first and second members, said sleeve surrounding said frame upon retention of said ends against said first and second members; and

means for displacing said shaft to shift said second member away from said first member and stretch the fabric of said sleeve.

4,151,037

DEVICE FOR APPLYING BINDING STRIPS TO THE BACKS OF LAYERS OF PAPER

Hannsgeorg Klingelhoefer, and Friedrich Mann, both of Nuertingen, Fed. Rep. of Germany, assignors to Bielomatik Leuze & Co., Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,585

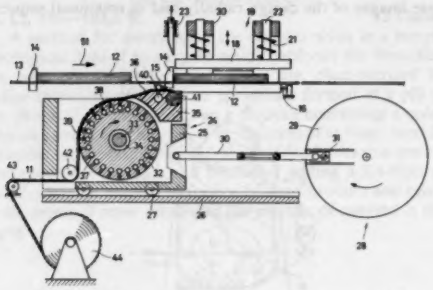
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1977, 2708066

Int. Cl.[2] B32B *31/00*; B42C *19/00*

U.S. Cl. 156—477 B **24 Claims**

1. A device for applying binding strips to the backs of stacks of paper layers such as books, pads or the like, which comprises an application station by means of which the binding strips can be applied to the stacks of paper which are fed at

intervals through the device, a feed device for feeding the binding strips to the application station, a cutting device for cutting off the required length of binding strip, the cutting device being arranged to, in use, be effective directly behind



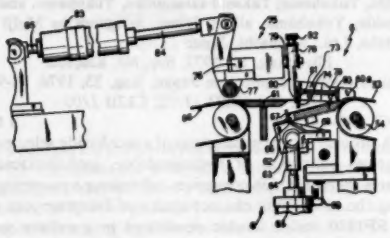
the trailing edge of each stack of paper, and a controllable pressing device by means of which the stacks of paper and the application station may be moved towards one another in a controlled manner and pressed against one another.

4,151,038

APPARATUS FOR JOINING THE ENDS OF FABRIC STRIPS

Franco Bottasso, and Silvio Manini, both of Milan, Italy, assignors to Industrie Pirelli, S.p.A., Milan, Italy

Filed May 13, 1977, Ser. No. 796,592
Claims priority, application Italy, Jun. 28, 1976, 24791 A/76
Int. Cl.[2] G03D *15/04*
U.S. Cl. 156—507 **14 Claims**



1. An apparatus used for tire manufacture for successively joining the overlapping rear end of a deformable material band, obtained by joining together a number of pieces of said material, and the fore end of pieces of the same deformable material comprising:

at least one fixed supporting surface adapted to receive an end portion of said band; means for advancing said band on the fixed supporting surface; means for stopping advancement of said band when the rear edge of the band slightly protrudes beyond an adjacent corresponding edge of said fixed supporting surface; a mobile plate adapted to successively receive each one of said pieces to be joined to said band; a first conveyor constrained between extremity rollers for advancing each piece on said plate; means for stopping the advancement of a piece on said mobile plate when its fore edge is substantially in coincidence with the relative adjacent edge of said mobile plate, the initial relative position of said mobile plate to the fixed supporting surface being such that said edge of said plate is substantially below said edge of said fixed supporting surface; means for rotating said mobile plate about an axis substantially parallel to the axis of said first conveyor rollers towards the fixed surface to bring the fore edge of said piece lying on it below said protruding portion of said band for overlapping said piece fore edge and said band protruding portion; and, means comprising a mobile tool which is brought into contact with said protruding portions for pressing said overlapping piece fore edge and said band protruding portion, said apparatus further comprising:

a pair of thrust elements, each one of said thrust elements being respectively axially shiftable with respect to said fixed supporting surface and to said mobile plate and adapted to come into contact with a respectively associated band rear protruding edge and deformable piece fore edge for shifting said band rear protruding edge and deformable piece fore edge towards the relative adjacent edge of the corresponding fixed supporting surface and plate a pre-set distance and for forming in both band and piece an abundance wave, a first thrust element of said pair of thrust elements comprising a number of protruding elements which are fixed on a mobile frame each one of which is adapted to pass through a corresponding perforation provided near a fore edge of said mobile plate; fluid dynamic cylinders for controlling the relative movement between said plate and mobile frame such that said mobile frame with the protruding elements is shifted towards the mobile plate to cause the protruding elements to come in contact with the fore edge of the piece lying on the plate and shift the piece fore edge so that the formation of an abundance wave is caused in the piece, said means for rotating causing said mobile plate to be rotated after said abundance wave is caused; a pressure element; and, an elastic member for pushing said pressure element towards said plate where it contacts said piece and applies pressure thereto during the rotation of said plate by said means for rotating, said pressure element holding the shifted fore edge of said piece with respect to said plate edge during the rotation of the plate as the edge of the piece disengages from said protruding elements due to plate rotation.

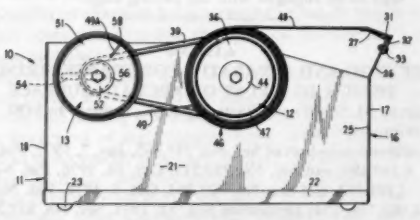
2. An apparatus according to claim 1 further comprising a magazine for storage of said fabric pieces wherein said pieces are arranged in an orderly configuration, a second conveyor suitable to successively convey pieces spaced from each other by a pre-set distance from a charging station to said magazine, and a transferring device adapted to transfer successively a number of pieces from said magazine to said first conveyor for making each piece advance on said plate.

4,151,039

DOUBLE ADHESIVE TAPE DISPENSER

Donald W. Lash, 4443 Poinsettia, SE., Kentwood, Mich. 49508

Filed May 30, 1978, Ser. No. 910,745
Int. Cl.[2] B32B *35/00*; B65N *5/28, 17/02*
U.S. Cl. 156—584 **8 Claims**



1. A portable dispenser for dispensing double-coated adhesive tape wound in a roll with a removable backing strip, comprising:

a portable frame including a bottom wall, and a sidewall fixed to the bottom wall and projecting upwardly therefrom in substantially perpendicular relationship;

tape cutting means fixedly mounted on said frame adjacent one end thereof, said tape cutting means including an

elongated cutting bar having an elongated upper cutting edge extending substantially horizontally, said cutting edge being spaced upwardly from said bottom wall and extending substantially perpendicularly with respect to said sidewall;

first cantilevered spindle means mounted on said sidewall and projecting horizontally outwardly thereof in substantially perpendicular relationship thereto, said first cantilevered spindle means being adapted to have said roll mounted thereon;

second cantilevered spindle means mounted on said sidewall and projecting horizontally outwardly therefrom in substantially perpendicular relationship thereto, said first and second spindle means being disposed in radially spaced but substantially parallel relationship, and said second spindle means being adapted to wind thereon the backing strip after same has been separated from the adhesive tape;

said first cantilevered spindle means including a first support shaft fixed to and projecting horizontally and perpendicularly outwardly from one side of said sidewall, and a support roller rotatably supported on said first support shaft, said support roller being adapted to have said roll of tape removably positioned thereon for rotation therewith;

said second spindle means including a second cantilevered support shaft fixed to and projecting horizontally and perpendicularly outwardly from said one side of said sidewall, and a takeup roller rotatably supported on said second support shaft, said takeup roller having means associated therewith for permitting the backing strip to be wound therearound, said takeup and support rollers being of similar diameter;

drive means for drivingly connecting said takeup and support rollers to cause rotation of said takeup roller in response to rotation of said support roller, said drive means including a first annular belt-engaging pulley coaxial with and nonrotatably connected to said support roller, a second annular belt-engaging pulley coaxial with and nonrotatably connected to said takeup roller, said second pulley being of substantially smaller diameter than said first pulley, and an endless friction-type drive belt extending between and being in driving engagement with said first and second pulleys, the driving transmission between said pulleys and said belt being due solely to the frictional engagement therebetween; and

engaging means for deflecting and engaging the length of tape which extends between the support roller and the cutting edge, said engaging means including a tape support member positioned closely adjacent said cutting edge in the region between said cutting edge and said support roller, said tape support member being stationarily fixed relative to said frame at an elevation whereby it causes the tape segment which extends from said support roller to said cutting edge to engage said support member and to be deflected from a straight line path in order to permit the tape to be engaged with the cutting edge.

4,151,040

METHOD AND APPARATUS FOR TRANSFERRING A DESIGN TO A FLAT OR ARCUATE SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Westport, Conn.

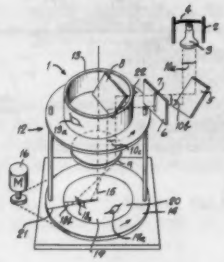
Continuation-in-part of Ser. No. 757,505, Jan. 7, 1977, Pat. No. 4,119,484, and Ser. No. 733,711, Oct. 18, 1976, Pat. No. 4,101,373, and Ser. No. 729,764, Oct. 5, 1976, Pat. No. 4,102,734. This application Sep. 12, 1977, Ser. No. 832,382

Int. Cl.[2] C23F *1/02*; G03B *27/32, 21/00*

U.S. Cl. 156—659 **25 Claims**

1. A method of transferring a design from a flat rectangular-coordinate form to a flat polar-coordinate form, comprising progressively projecting successive narrow transverse images of the design radially from a flat rectangular transparency formed into a cylindrical shape, and redirecting the path of projection substantially perpendicular to the cylinder radii such that the design images are projected upon and received in sequence in polar-coordinate form by corresponding narrow radial areas of a flat surface.

18. Apparatus for transferring a design from a flat rectangular-coordinate form to a flat polar-coordinate form, comprising projection means for progressively projecting narrow transverse images of the design radially and in rotational sequence



from a flat rectangular transparency formed into a cylindrical shape, and reflector means adapted to redirect the path of projection substantially perpendicular to the cylinder radii such that the design images are projected upon and received in polar-coordinate form by corresponding narrow radial areas of a flat image surface.

4,151,041

PROCESS FOR PRODUCTION OF MALTOPENTAOSE AND MALTOHEXAOSE

Katsuyoshi Iwamatsu, Kanagawa; Shoji Omoto, Tokyo; Takashi Shomura, Yokohama; Shigeharu Inoue, Yokohama; Taro Niida, Yokohama; Takashi Hisamatsu, Yokohama, and Singo Uchida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Kyobashi, Japan

Filed Aug. 22, 1977, Ser. No. 826,762

Claims priority, application Japan, Aug. 23, 1976, 51-99756

Int. Cl.[2] C12D *13/02*; C12B *1/00*

U.S. Cl. 195—31 P **3 Claims**

1. A process for the production of a saccharide selected from the group consisting of maltopentaose, maltohexaose, and mixtures thereof which comprises cultivating a microorganism having the identifying characteristics of Streptomyces myxogens SF1130 under aerobic conditions in a culture medium containing nutrient sources for a time sufficient to produce and accumulate said saccharide, and recovering said saccharide.

4,151,042

METHOD FOR PRODUCING MAYTANSINOL AND ITS DERIVATIVES

Eiji Higashide, Takarazuka; Mitsuko Asai, Takatsuki, and Seiichi Tanida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 29, 1977, Ser. No. 811,442

Claims priority, application Japan, Mar. 31, 1977, 52-37167; Apr. 1, 1977, 52-37885

Int. Cl.[2] C12D *9/20*

U.S. Cl. 195—96 **5 Claims**

1. A method for preparing maytansinol, maytanacine or maytansinol propionate which comprises cultivating a microorganism belonging to the genus Nocardia and being capable of producing maytansinol, maytanacine or maytansinol propionate in a culture medium containing assimilable carbon sources and digestible nitrogen sources until maytansinol, maytanacine or maytansinol propionate is substantially accumulated therein, and recovering the same.

4,151,043

ENZYME DETERMINATION METHOD

Rabindra N. Bhattacharyya, Crestwood, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

Filed Nov. 19, 1976, Ser. No. 743,350
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R 12 Claims

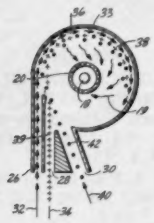
1. A method for determining the concentration in a sample of biological fluid of an enzyme which catalyzes the formation of at least one triose or triose phosphate, characterized by alkaline treatment of the triose phosphate formed at a pH of from about 11 to about 12.25 in a mixture containing a color enhancing amino alcohol in a concentration of at least about 25 millimolar, said mixture being free of added hydrazine during all stages of the method, and thereafter adding a 2,4-dinitrophenylhydrazine reagent to form a colored product and relating the depth of color formed to the amount of enzyme in the sample.

4,151,044

PROCESS FOR THE PYROLYSIS OF CARBONACEOUS MATERIALS IN A DOUBLE HELIX CYCLONE

Charles K. Choi, Fullerton, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 700,001, Jun. 25, 1976, Pat. No. 4,070,250. This application Jan. 23, 1978, Ser. No. 871,447
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.[2] B01D *45/12;* C10B *1/00, 49/16;* C10G *1/00*
U.S. Cl. 201—12 25 Claims



1. In a process for the pyrolysis of carbonaceous materials in which the carbonaceous material is primarily pyrolyzed by heat transferred thereto from a high temperature, particulate solid source of heat to yield as products of pyrolysis, a pyrolytic vapor containing hydrocarbons and a particulate carbon containing solid residue, the improved method of achieving pyrolysis which comprises the steps of:

(a) essentially tangentially introducing to and passing along a path formed by the curved inner surface of a cyclone reaction-separation zone having a vapor outlet at one end and a solids outlet at the base thereof, a high velocity, high temperature stream of the particulate solid source of heat, wherein the stream has an introduction velocity greater than about 100 feet per second and up to about 250 feet per second; while

(b) introducing to the cyclone reaction-separation zone a low velocity stream of carbonaceous material having a velocity of from about 50 to about 200 feet per second and at least 50 feet per second less than the velocity of the high velocity stream of particulate solid source of heat in a flow path essentially parallel to the flow path of the high velocity stream of the particulate solid source of heat, wherein the high velocity stream of the particulate solid source of heat serves to prevent carbonaceous material from contacting and agglomerating on the inner surface of the cyclone reaction-separation zone; while

(c) introducing to the cyclone reaction-separation zone into at least the entering path of the low velocity stream of carbonaceous material a low velocity, high temperature stream of the particulate solid source of heat having a velocity of from about 50 to about 200 feet per second and at least 50 feet per second less than the velocity of the high velocity stream of particulate solid source of heat at an angle inclined toward the path of travel of carbonaceous material to penetrate and initiate pyrolysis of the carbonaceous material, the introduced quantity of particulate solid source of heat in the low velocity and high velocity streams of particulate solid source of heat being sufficient to raise the carbonaceous material to a pyrolysis temperature of at least about 600° F.; and

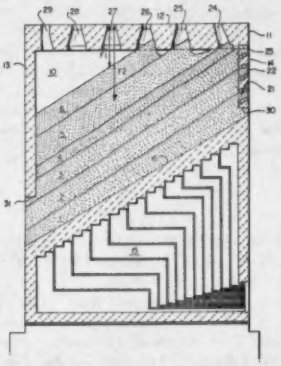
(d) separating a gaseous stream containing the pyrolytic vapor from a solids mixture including the particulate solid source of heat and the carbon containing solid residue by the formation of flow patterns of each by action of induced centrifugal forces.

4,151,045

APPARATUS FOR CHARGING INCLINED CHAMBER COKE OVEN

Dietrich Wagener, Essen, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 751,707, Dec. 17, 1976. This application Jun. 21, 1977, Ser. No. 808,774
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1975, 2559118
Int. Cl.[2] C10B *11/00*
U.S. Cl. 202—128 3 Claims



1. An inclined chamber coke oven comprising:

a coke oven chamber defined by a horizontal chamber ceiling, a heating side wall, a coke removal side and a chamber floor inclined from said heating side wall to said coke removal side;

a plurality of charging holes arranged vertically one above the other and extending through said heating side wall into said chamber;

a plurality of charging holes extending through said chamber ceiling and arranged one after the other in a direction from said heating side wall to said coke removal side; and

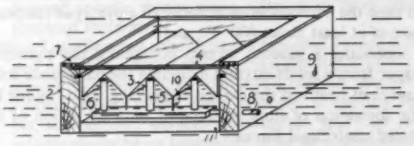
the lowermost of said charging holes in said heating side wall being spaced above said inclined chamber floor by a predetermined distance less than that distance which would cause breakage of briquettes of charging material dropping from said lowermost charging hole to said chamber floor, and the vertical distance between adjacent of said charging holes in said heating side wall and the horizontal distance between adjacent said charging holes in said chamber ceiling being dimensioned such that the vertical distance of drop of briquettes from each of said charging holes to a fill layer formed through the preceding charging hole in the charging sequence is less than that distance which would cause breakage of the briquettes.

4,151,046

DOUBLE EFFECT FLOATING SOLAR STILL COMPRISING A SUBMERGED CONDENSING SYSTEM

Joseph Eidelberg, 8 Clafford Lane, Melville, N.Y. 11746

Filed Mar. 27, 1978, Ser. No. 890,785
Int. Cl.[2] C02B *1/06*
U.S. Cl. 202—180 **2 Claims**



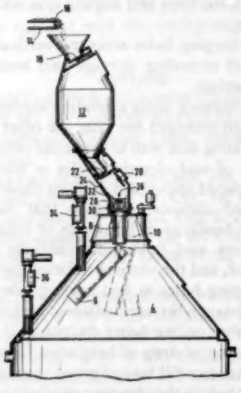
1. A double effect floating solar distillation apparatus for the recovery of potable water from brackish or sea water, comprising a floating frame having its top covered by transparent glass, its bottom closed by wooden boards and is sides having water inlets close to the bottom, to admit sea or brackish water into the inner confine of the said floating frame, to be preheated, prior to its evaporation, by a submerged condenser which is situated in the inner confine of said floating frame, between the wooden bottom of the said frame and a corrugated heat absorbing metal plate which is supported in the inner confine of said floating frame in such manner that one part of the said corrugated heat absorbing metal plate is immersed in the distilland, while the other part, consisting of the ridges of the said corrugated heat absorbing metal plate, remains above the surface of the distilland, leaving free space under the ridges to be used as ducts to enable the vapor produced under the ridges to flow through conduits which are connected to the condenser in such manner that their tops protrude into the underside of the ridges of the corrugated heat absorbing metal plate, enabling the vapor to flow into a submerged condenser to be condensed into potable water which can be taken out of the condenser through suitable outlets.

4,151,047

FEED INSTALLATION FOR APPARATUS FOR EXTRACTING HYDROCARBONS FROM BITUMINOUS SCHISTS

Edouard Legille, Luxembourg, and René Mahr, Howald-Hesperange, both of Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Aug. 5, 1977, Ser. No. 822,345
Claims priority, application Luxembourg, Aug. 13, 1976, 75590
Int. Cl.[2] B66C *17/08*; C10B *31/02*
U.S. Cl. 202—262 **12 Claims**



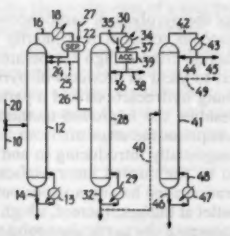
1. A feed system for apparatus for extracting hydrocarbons from the bituminous schists comprising a plurality of retorts in linear array radially of a schist distributing tower, each of said retorts having a rotary distribution spout of which the angle of inclination is adjustable and controlled, means for rotating said spout, a feed channel centrally positioned at the top of each said retort and discharging at its lower end into said distribution spout, at least one hopper communicating with said feed channel via an inclined discharge channel and mounted above each said retort and being offset in respect of the vertical axis of the retort, means coacting between and within said feed channel and said inclined discharge channel at the intersection thereof for slowing up the descent of schist from said hopper into said retort and including an upper portion extending into said inclined discharge channel vertically and a lower portion extending into the feed channel vertically, and a plurality of individual conveyors each communicating between the central distributing tower and the said at least one offset hopper of each retort to transport said schists from said central distributing tower to said retorts, and conveyor means coacting with the lower end of each of said retorts for removal of spent schists.

4,151,048

RECOVERY OF ALKYLENE GLYCOLS BY AZEOTROPIC DISTILLATION

Mitchell Becker, Teaneck, N.J., and Howard M. Sachs, Riverdale, N.Y., assignors to Halcon Research and Development Corporation, New York, N.Y.

Filed Jun. 6, 1977, Ser. No. 804,033
Int. Cl.[2] B01D *3/36*; C07C *29/28*
U.S. Cl. 203—6 **4 Claims**



1. In the distillation of a mixture comprising ethylene glycol or propylene glycol and the monocarboxylate esters and dicarboxylate esters of the glycol to recover the glycol therefrom, including distillation in the presence of an azeotroping agent which is an alkyl-substituted aromatic hydrocarbon having a boiling point at atmospheric pressure of 135° C. to 220° C., wherein the azeotroping agent is at times in the vapor state and at times in the liquid state and tends to undergo slight chemical reaction while in the distillation system, the improvement which comprises employing an azeotroping agent having a content of oxygenated impurities of at most about 100 ppm and maintaining said azeotroping agent under an atmosphere consisting essentially of an inert gas when said azeotroping agent is in the liquid state at least immediately prior to said distillation and after said distillation while the azeotroping agent is contained in the distillation system.

4,151,049
COMPOSITIONS HAVING PROTEIN REACTIVE GROUPS, MEMBRANES, ELECTRODES COATED WITH SUCH COMPOSITIONS AND CHEMICAL ANALYSIS METHODS

Jiri Janata, Salt Lake City, Utah, assignor to Imperial Chemical Industries Limited, London, England

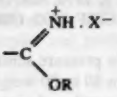
Filed Mar. 16, 1977, Ser. No. 778,169

Claims priority, application United Kingdom, Mar. 16, 1976, 10465/76

Int. Cl.[2] G01N *27/30, 27/46, 31/14*

U.S. Cl. 204—1 T **7 Claims**

1. In a composition comprising a hydrophobic organic polymeric substrate having essentially hydrocarbon chains absorbed onto the surface thereof, said hydrocarbon chains having a group reactive with a protein attached thereto, the improvement which comprises as a protein reactive group an ionic protein bonding linkage to said hydrocarbon chains, said ionic linkage being derived from an imido ester of the formula



where R is an alkyl group and X^- is HCl or HBr.

6. Apparatus comprising a composition according to claim 1 and means for detecting a change in the electrical potential associated with the said composition when it contacts a chemical substance reactive with the specific protein reactive group attached to said composition.

7. A method of detecting the presence of a chemical substance which comprises contacting the chemical substance with an electrode in association with the composition of claim 1, said composition being specifically reactive with the chemical substance and said electrode being responsive to a change in the electrical charge in said composition, and detecting any resultant change in the said electrical charge.

4,151,050
PROCESS FOR PRODUCING SULFONES

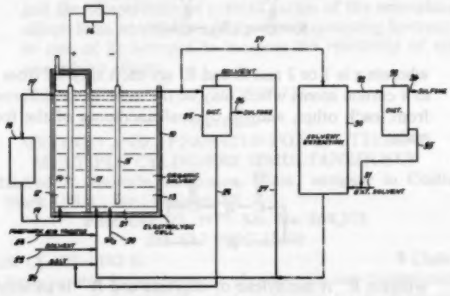
Bertel Kastening, and Dierk Knittel, both of Hamburg, Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft, Julich, Fed. Rep. of Germany

Continuation of Ser. No. 811,678, Jun. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 647,812, Jan. 9, 1976, Pat. No. 4,053,402, which is a continuation-in-part of Ser. No. 474,167, May 29, 1974, Pat. No. 3,980,535. This application Jul. 10, 1978, Ser. No. 923,328

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1973, 2328196; Jan. 10, 1975, 2500727; Jun. 20, 1976, 2629320

Int. Cl.[2] C25B *3/04*

U.S. Cl. 204—59 R **8 Claims**



1. In a process for producing a sulfone in which sulfur dioxide solubilized in an aprotic solvent is electrolyzed with substantially the maximum current density that produces only SO_2^- ions and with a voltage that does not exceed substantially 0.1 volt with reference to the standard potential of the SO_2/SO_2^- redox couple, the resulting sulfur dioxide anion being reacted at a temperature between the freezing and boiling points of the solution with an organohalogen compound, the improvement wherein said organohalogen compound is formed in situ in said electrolyte by the reaction of a halogen-ion-forming salt and a phosphoric acid triester where the halogen is selected from the group which consists of chlorine, bromine and iodine, said halogen-ion-forming salt being selected from the group which consists of tetraalkylammoniumhalogenide, tetraalkylphosphoniumhalogenide, tetraarylammoniumhalogenide and tetraarylphosphoniumhalogenide.

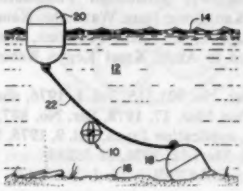
4,151,051
ELECTRODEPOSITION MINING OF MATERIALS FROM NATURAL WATER BODIES

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Filed May 1, 1978, Ser. No. 901,499

Int. Cl.[2] C25B *1/00, 9/04*

U.S. Cl. 204—86 **19 Claims**



1. A method of mining dissolved or suspended materials including metallic ions and compunds of metals carried by and contained within a natural body of naturally moving water, such as ocean water or the like, comprising:

suspending a deposition unit in a natural body of naturally moving water in a condition in which the moving water establishes a flow of water and said materials relative to and substantially encompassing the deposition unit, said deposition unit comprising a cathode surface which is exposed substantially only to the natural flow of water and said materials, and means operatively associated with the cathode surface for establishing a flow of electrical current through the water at the cathode surface;

establishing a flow of electrical current in the water at the cathode surface to electrolytically deposit materials from the water on the cathode surface; and

deriving energy for creating the flow of electrical current from a natural energy source occurring at the body of water.

4,151,052
PROCESS FOR PRODUCING SODIUM HYPOCHLORITE

Nobutaka Goto, and Hiroshi Daidoji, both of Tokyo, Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Filed Feb. 3, 1978, Ser. No. 875,065

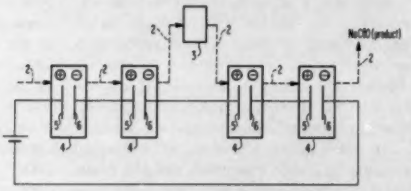
Claims priority, application Japan, Feb. 18, 1977, 52-16088; Feb. 18, 1977, 52-16089

Int. Cl.[2] C25B *1/26*

U.S. Cl. 204—95 **15 Claims**

1. A process for producing sodium hypochlorite which comprises electrolyzing an aqueous solution of sodium chloride as an electrolyte solution in a non-diaphragm electrolytic cell comprising at least one unit cell, wherein the ratio of the actual area of the anode to the actual area of the cathode in the electrolytic cell is at least about 1.5:1 or larger, the concentration of the sodium chloride aqueous solution is about 20 g/liter

to about 50 g/liter, the effective average current density at the cathode is about 20 A/dm^2 to about 80 A/dm^2 and the effective



average current density at the anode is about 4 to about 60 A/dm^2.

4,151,053

CATION EXCHANGE MEMBRANE PREPARATION AND USE THEREOF

Naomi Seko; Yasumichi Yamakoshi, both of Tokyo; Hirotsugu Miyauchi, Kanagawa; Mitsunobu Fukumoto, Kanagawa; Kyoji Kimoto, Kanagawa; Itaru Watanabe, Kanagawa; Toshioki Hane, Kanagawa, and Sakae Tsushima, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 701,515, Jul. 1, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,761

Claims priority, application Japan, Jul. 9, 1975, 50-84111; Jul. 9, 1975, 50-84112; Mar. 31, 1976, 51-35593

Int. Cl.^{2} C25B *1/16, 1/26, 13/08*

U.S. Cl. 204—98 **34 Claims**

1. A cation exchange membrane comprising a fluorocarbon polymer containing a plurality of pendant carboxylic acid or salt groups of the formula —OCF_2COOM wherein M is selected from the group consisting of hydrogen; ammonium; quaternary ammonium; and metallic atoms.

30. An electrolytic cell comprising an anode portion and a cathode portion separated by a membrane comprising a fluorocarbon polymer containing a plurality of pendant carboxylic acid or salt groups represented by the formula:

$$-OCF_2COOM$$

wherein M is selected from the group consisting of hydrogen; ammonium; quaternary ammonium; and metallic atoms.

33. In a method for the electrolysis of an aqueous solution of an alkali metal halide for the production of the corresponding halogen and alkali metal hydroxide, the improvement comprising utilizing the electrolytic cell of claim 30.

4,151,054

PROCESS FOR OBTAINING SURFACES WITH A NACRE LIKE EFFECT ON GOLD OR SILVER JEWELRY ARTICLES

Olivio Caloni, via Curtatone, 2, and Alfredo Cantini, Piazza Giotto, 20, both of Arezzo, Italy (52100)

Filed Sep. 9, 1977, Ser. No. 831,922

Int. Cl.^{2} C25F *3/16*

U.S. Cl. 204—129.35 **4 Claims**

1. A process for obtaining a nacre-like effect on surfaces of articles made of gold, silver or alloys thereof comprising the steps of:

(a) selecting a material from the group consisting of gold, silver, and jewelry alloys thereof having a high purity,

(b) heating said material in a crucible to obtain the highest possible temperature above the melting temperature of said material, while maintaining the crucible integrity as well as not altering the material to be treated;

(c) molding said material in a mold at a temperature compatible with the resistance of said mold to form an article;

(d) allowing said article to cool to ambient temperature inside of said mold;

(e) surface treating said article at least on those surfaces on which the effect is to appear by a mechanical polishing;

(f) electrochemically treating said article by placing the same in an electrolytic bath as an anode using very low current densities, said bath containing conventional electrochemical polishing salts having a cyanide content; and

(g) carefully washing said treated article.

4,151,055

RADIATION CURABLE ADHESIVE COMPOSITIONS

Kenneth C. Stueben, Bridgewater; Raymond G. Azrak, Whitehouse Station, and Michael F. Patrylow, Kenilworth, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,801

Int. Cl.^{2} C08F *8/00*; C08L *31/02*

U.S. Cl. 204—159.15 **12 Claims**

1. A radiation curable pressure sensitive adhesive composition comprising (a) from 80 to 90 weight percent of a poly(vinyl alkyl ether) having a reduced viscosity of from 0.1 to 0.8, measured at a concentration of 0.1 grams of resin in 100 ml. of benzene at 20° C., in which the alkyl unit has from 1 to 4 carbon atoms, (b) from 10 to 20 weight percent of a multifunctional acrylate compound, and (c) from 0 to 10 weight percent of a photoinitiator.

4,151,056

RADIATION CURABLE COATING COMPOSITIONS CONTAINING ALKANEDIONES OR CYCLOALKANEDIONES

Kisoon Park, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,877

Int. Cl.^{2} C08F *8/00*

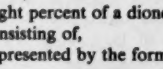
U.S. Cl. 204—159.16 **10 Claims**

1. A radiation curable coating composition comprising:

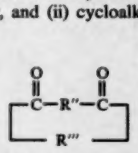
(A) from 20 to 80 weight percent of a radiation reactive oligomer or resin containing at least one ethylenically unsaturated site per molecule having a viscosity of from 100 cps. to 800,000 cps. at 25° C.;

(B) from 5 to 30 weight percent of a dione compound chosen from the group consisting of,

(i) alkanediones represented by the formula



wherein x is 1 or 2 and R and R' are each alkyl of from 1 to 4 carbon atoms which may be the same as, or different from, each other, and (ii) cycloalkanediones of the formula



wherein R'' is methylene or ethylene and R''' is an alkylene segment completing a 5 to 8 carbon ring structure;

(C) from 0 to 50 weight percent of a polyfunctional monomeric acrylate or or methacrylate crosslinker; and

(D) from 0 to 10 weight percent of a photoinitiator.

4,151,057

HIGH TEMPERATURE ADHESIVE MADE BY EXPOSURE TO RADIATION

David J. St. Clair, and David R. Hansen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 14, 1978, Ser. No. 933,218
Int. Cl.[2] C08F 8/00
U.S. Cl. 204—159.17 11 Claims

1. An adhesive composition possessing excellent UV stability and high temperature cohesive strength prepared by the electron beam curing of an adhesive composition, said adhesive composition comprising:

(a) 100 parts by weight of a block copolymer component comprising an A'B' block copolymer and a multiblock copolymer having at least two end blocks A and at least one mid block B wherein the A' and A blocks are monoalkenyl arene polymer blocks and the B' and B blocks are substantially completely hydrogenated conjugated diene polymer blocks;

(b) about 25 to about 200 parts by weight of a tackifying resin compatible with block B; and

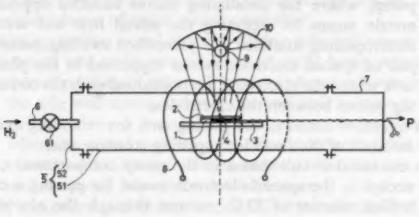
(c) about 1 to about 100 parts by weight of a di-to-tetra-functional acrylate or methacrylate selected from the group consisting of the acrylic and methacrylic acid esters of polyols.

4,151,058

METHOD FOR MANUFACTURING A LAYER OF AMORPHOUS SILICON USABLE IN AN ELECTRONIC DEVICE

Daniel Kaplan, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 5, 1978, Ser. No. 912,533
Claims priority, application France, Jun. 6, 1977, 77 17245
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 S 5 Claims



1. A method for manufacturing a layer of high resistive amorphous silicon onto a substrate, said method comprising at least the following steps:

(a) depositing under a partitial vacuum without adding hydrogen a layer of amorphous silicon onto said substrate;

(b) maintaining said layer at a temperature between 100° C. and the temperature of crystallization of the amorphous silicon in an atmosphere of a plasma containing hydrogen or one of its isotopes to increase the resistivity of said amorphous silicon.

4,151,059

METHOD AND APPARATUS FOR SPUTTERING MULTIPLE CYLINDERS SIMULTANEOUSLY

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Stork U.S.A., Inc., Chicago, Ill.

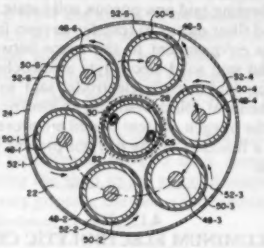
Filed Dec. 27, 1977, Ser. No. 864,375
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 R 8 Claims

1. Apparatus for sputtering a photoconductive coating onto a plurality of sleeves of substrate material simultaneously which comprises:

A. a sputtering vessel having a sputtering chamber and means for establishing an r.f. plasma belt in the chamber including centrally disposed target means adapted to be of material corresponding to said photoconductive coating and defining a cylindrical surface and an assembly of a plurality of spaced anodes arranged in the chamber annularly of said target means, each anode being spaced from the target means and the distance being such that the plasma belt engages each of the anodes on the surface thereof,

B. each anode being generally cylindrical and the axis of each being parallel to the axis of the target means, all of the anode axes being arranged in a circle and defining a cylinder whose diameter is greater than that of the target means and which is coaxial with the target means,

C. means for mounting and driving the anodes in an epicyclical movement around the target means axis so that the surfaces of the anodes rotate through the plasma belt to



deposit a continuous, seamless and substantially uniform sleeve of said photoconductive material onto all of said anodes simultaneously, and

D. each anode including a mandrel having means for mounting a sleeve of substrate material onto the mandrel to constitute said anode and receive the coating thereon.

8. A method of sputtering which includes establishing a sputtering r.f. plasma between a fixed target and a plurality of anodes within a sputtering chamber and providing suitable conditions within the chamber to effect the sputtering of the material of the target onto the anode which comprises,

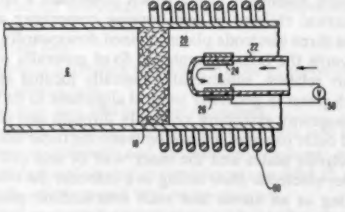
arranging the anodes in a circle around the target to establish plasma between target and all anodes simultaneously and moving the anodes in an epicyclical movement around said target while the plasma is established to deposit the target material on all sides of the anodes.

4,151,060

SOLID STATE FILTER FOR GAS SENSORS

Arnold O. Isenberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 1, 1978, Ser. No. 874,186
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S 5 Claims



1. In an oxygen measuring apparatus including an oxygen ion conductive solid electrolyte electrochemical cell including a solid electrolyte member having a reference electrode dis-

posed on one surface thereof and a sensing electrode disposed on an opposite surface thereof, and an oxygen reference media contacting said reference electrode wherein said electrochemical cell monitors the oxygen in a gas environment containing particulate matter and/or corrosive constituents which are potentially damaging to the solid electrolyte electrochemicial cell, the improvement for protecting said solid electrolyte electrochemical cell from potentially damaging particulate matter and corrosive constituents, the improvement comprising,

a non-porous, solid-state filter means exhibiting sufficient electronic and oxygen ion conductivity to support the transfer of oxygen ions at elevated temperatures, said filter means being physically and operationally spaced apart from said solid electrolyte electrochemical cell and disposed between said monitored gas environment and said sensing electrode to isolate said cell from direct contact with the monitored gas environment, and

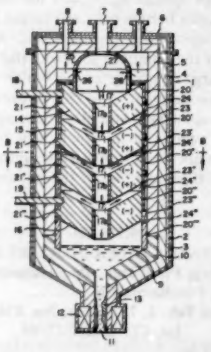
means for heating said non-porous, solid-state filter means to cause said filter means to transfer oxygen from said monitored gas environment to the space between said filter means and said solid electrolyte electrochemical cell for contacting said sensing electrode, said solid electrolyte electrochemical cell developing an electrical signal indicative of the oxygen content of said monitored gas environment as a function of the oxygen present at said sensing electrode.

4,151,061

ALUMINUM ELECTROLYTIC CELL

Tatsuo Ishikawa; Shoichi Konda, both of Sapporo; Toshiaki Iuchi, Shizuoka, and Hachiro Ichikawa, Shimizu, all of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,631
Int. Cl.[2] C25C *3/06, 3/14*
U.S. Cl. 204—247 **9 Claims**



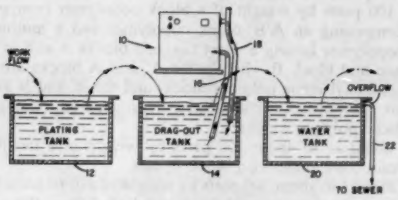
1. A sealed electrolytic cell for electrolyzing a molten salt electrolytic bath containing aluminum chloride to produce molten aluminum metal which comprises a cell housing an electrical element in said housing comprising an array of at least three electrode plates inclined downwardly and inwardly towards the housing center in fixed generally parallel spaced apart relation, substantially centrally located apertures in all such plates in generally vertical alignment to define a common passageway extending vertically through said electrode array and outer passages defined between the outer side edges of said electrode plates and the inner wall of said cell housing, one outer electrode plate acting as a cathode, the other outer plate acting as an anode and each intermediate plate acting as a bi-polar electrode, raw material inlet means at the top of said housing for introducing aluminum chloride into the electrolyte bath above and in substantial alignment with the central common passageway in said electrode plate array, chlorine gas discharging means at the top of said housing, and an aluminum metal collecting reservoir at the bottom of said housing below said electrode element.

4,151,062

METALS RECOVERY APPARATUS

Richard J. Norris, 3801 Lakeview Ter., Falls Church, Va. 22041

Filed Jan. 4, 1978, Ser. No. 866,919
Int. Cl.[2] C25C *7/00*
U.S. Cl. 204—273 **9 Claims**



1. A metals recovery apparatus comprising

a housing having an interior divider wall, dividing the housing into a plating tank compartment and a pump compartment;

a pump-motor assembly in the pump compartment having a first electroplating solution inlet tubing connection and a second electroplating solution inlet tubing connection and an outlet tubing line connection for a first electroplating solution and a second electroplating solution;

means for controlling the mixing of a first electroplating solution and a second electroplating solution, located in the second electroplating solution inlet tubing;

an electroplating solution circulating means supported in the plating tank and connected to an outlet tubing line of the pump, where the circulating means includes opposited nozzle means for agitating the mixed first and second electroplating solutions in a prescribed swirling pattern;

a pair of spaced electrode means supported in the plating tank where the electrodes are positioned with the circulating means between the electrodes;

an overflow outlet in the plating tank for removing excess amounts of the first electroplating solution; and

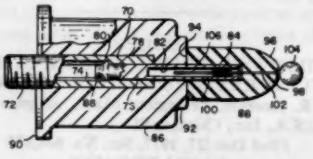
an electrical circuit means in the pump compartment connected to the spaced electrode means for passing a controlled amount of D.C. current through the electrode means.

4,151,063

ELECTROPLATING RACK

Samuel Nelson, Providence, R.I., assignor to Nelson Rack Company, Providence, R.I.

Filed Jan. 9, 1978, Ser. No. 867,918
Int. Cl.[2] C25D *17/06*
U.S. Cl. 204—297 W **11 Claims**



1. A detachable hanger element for mounting to an electroplating rack comprising a conductive part threaded at one end and means at the other end portion defining a resiliently expandable collet for frictionally receiving and maintaining the stem of an earring to removably support the same for plating, a jacket of chemically inert plastic material within which said

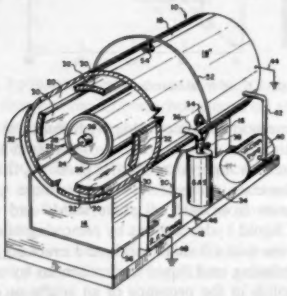
part is embedded with the threaded end extending from one end of the jacket and a portion of the colleted end extending from the other end of the jacket, and a removable cap mounted on the portion of the colleted end extending from the jacket with one end abutting the end of the jacket and the other end extending beyond the end of the colleted end, said cap containing an axial hole for receiving said colleted end of the conductive part and a passage extending axially from the end of the hole through the end of the cap of a diameter to receive the stem of the earring for engagement with the colleted end.

4,151,064

APPARATUS FOR SPUTTERING CYLINDERS

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Stork U.S.A., Inc., Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,378
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **15 Claims**



1. Apparatus for sputtering a photoconductive coating onto a seamless sleeve of metal which comprises:

(A) a sputtering vessel of metal having side wall means and spaced end walls, one of said end walls being separable from the adjacent side wall means and means for moving the side wall means and said one end wall relative to one another along a linear path between a closed position whereat a sealed sputtering chamber is defined within said vessel and an opened position whereat the said one end wall is spaced from the side wall means;

(B) a mandrel and means associated with said mandrel for removably holding the sleeve in rigid cylindrical configuration, said sleeve otherwise being thin walled and normally collapsible, and shaft means associated with the mandrel disposed coaxially of the cylindrical sleeve configuration;

(C) mounting means associated with at least said one end wall for supporting said mandrel shaft means for uniform rotation of the mandrel and sleeve thereon about an axis parallel to said one end wall linear path, said mandrel and sleeve thereon being entirely outside of the chamber and accessible in the opened position of said one end wall and being entirely within the chamber in the closed position of said one end wall, and drive means engaged with the shaft means for rotating said mandrel and sleeve thereon when in said chamber,

(D) target means formed of the photoconductive material defined as a plurality of arcuate segments defining together a coaxial cylinder slightly larger than said sleeve and means mounting the segments adjacent said sleeve and spaced therefrom across radial gaps of the order of several centimeters and said segments being spaced apart circumferentially of the sleeve and r.f. supply means coupled in matched circuits between said target means, sleeve and vessel to establish a sputtering condition and provide circumferentially spaced plasma belts in the chamber spanning the radial gaps between the target means and the sleeve said sleeve comprising an anode;

(E) said mandrel and sleeve thereon being removable from cooperative relationship with said supporting means for said mandrel shaft means when mandrel and sleeve are outside of the chamber to allow for quick mandrel replacement without disturbing the target means in the vessel.

9. Apparatus for sputtering a photoconductive coating onto a seamless sleeve of metal and in which there is a sputtering vessel and a sputtering chamber is formed in the vessel, said apparatus including means within and without the vessel but acting together for establishing an r.f. plasma belt within the vessel, said means including cylindrically arranged target means coupled to an r.f. power supply, the plasma belt adapted to be formed coaxial with and adjacent the surface of said target means, the seamless metal sleeve arranged to comprise an anode spaced from and arranged on an axis parallel to the target means with its exterior surface passing through at least a portion of said plasma belt, and means are provided for rotating the anode and for removing the anode from the chamber for replacement, and means for holding the sleeve which comprises:

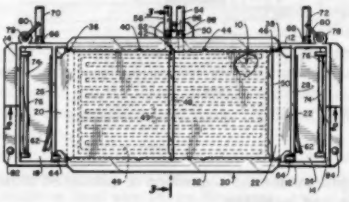
a mandrel having the sleeve mounted thereon to form the anode and including an elongate shaft, means for removably coupling the shaft to the rotating means and means for removably gripping the sleeve and maintaining same in a rigid cylindrical condition.

4,151,065

HORIZONTAL SLAB GEL ELECTROPHORESIS

Donald A. Kaplan, Topanga Canyon, and Gary L. Wilcox, Malibu, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jan. 30, 1978, Ser. No. 873,448
Int. Cl.² G01N *27/26, 27/28*
U.S. Cl. 204—299 R **20 Claims**



1. An apparatus for horizontal slab gel electrophoresis comprising:

a horizontal flat bed,

vertical chambers extending downward from opposite ends of said horizontal bed,

a frame enclosing said bed and said chambers,

partition means partitioning said vertical chambers into first compartments crosswise and immediately adjacent each end of said bed and second compartments parallel to and immediately adjacent said first compartments,

an open-ended horizontal trough removably resting on said horizontal bed, and

opening means for opening said first compartments for communication with said second compartments.

4,151,066
COAL LIQUEFACTION PROCESS

Tsoung-Yuan Yan, Philadelphia, Pa., and Wilton F. Espenscheid, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 769,486, Feb. 17, 1977, abandoned. This application Jan. 12, 1978, Ser. No. 869,070
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 LE 7 Claims

1. A process for the liquefaction of carbonaceous material selected from the group consisting of coal, lignite and peat which comprises the steps of

(1) forming a slurry by admixing said carbonaceous material in comminuted form with a highly aromatic petroleum residuum solvent having a boiling point between about 450° F. and 1200° F. which has

(a) an H_{Ar} proton content between about 30 and 50 percent,

(b) a H_{α} proton content of at least 30 percent,

(c) a H_{β} proton content below 20 percent,

(d) a H_{γ} proton content below 13 percent, and

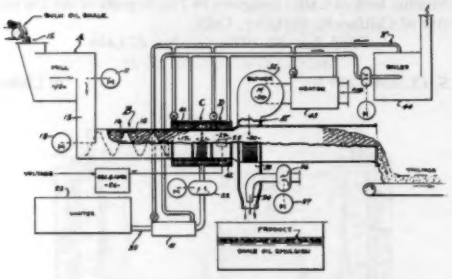
(e) a H_{α}/H_{β} proton ratio above about 1.4; and

(2) heating said slurry at a temperature between about 350° F. and 850° F. for a period of time sufficient to solubilize said carbonaceous material and form a homogeneous liquefaction solution phase and a solids phase containing ash and undissolved solids.

4,151,067
METHOD AND APPARATUS FOR ACQUISITION OF SHALE OIL

Harlow B. Grow, Pacific Palisades, Calif., assignor to Craig H. Grow, Pacific Palisades and Bruce W. Grow, El Cajon, both of, Calif., part interest to each

Filed Jun. 6, 1977, Ser. No. 803,666
Int. Cl.[2] B01D *11/02;* C10G *1/04*
U.S. Cl. 208—11 LE 16 Claims



1. A process for the acquisition of emulsified shale oil from oil shale, and including:

the first step of granulating the oil shale to expose its shale oil content;

the second step of compacting said granulated oil shale and exposed shale oil content and conveying the same as a confined mass through a passageway;

the third step of liquifying the exposed shale oil content in the moving mass of said granulated oil shale by admixing water therein to form a slurry thereof;

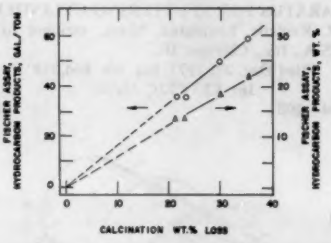
the fourth step of emulsifying the liquified shale oil content in the moving mass of said granulated oil shale by means of sonic energy applied to the passageway and the moving mass confined therein;

and the fifth step of separating the emulsified shale oil from the granulated oil shale as an end product and removing the same from the said granulations of the moving mass.

4,151,068
PROCESS FOR RECOVERING AND UPGRADING HYDROCARBONS FROM OIL SHALE

John D. McCollum, and Leonard M. Quick, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 664,016, Mar. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 474,907, May 31, 1974, abandoned. This application Jul. 8, 1977, Ser. No. 813,990
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE 14 Claims



1. In a method for recovering hydrocarbons from oil shale by contacting the oil shale solids with water at a high temperature and under a super-atmospheric pressure, the improvement which comprises recovering the maximum yield of liquid hydrocarbons from said oil shale solids and upgrading the recovered liquid hydrocarbons by removing said liquid hydrocarbons from said oil shale solids and cracking, desulfurizing, and demetalating said liquid hydrocarbons by contacting said oil shale solids in the presence of an acidic or oxidative catalytic substance with a water-containing fluid under super-atmospheric pressure, at a temperature in the range of from at least 705° F., the critical temperature of water, to about 900° F., in the absence of externally supplied hydrogen, said catalytic substance being molecular oxygen, carbon dioxide, a metal bisulfate, a metal bisulfite, or a compound which reacts in situ to form a metal bisulfate or a metal bisulfite, wherein sufficient water is present in the water-containing fluid and said pressure is sufficiently high so that the water in the water-containing fluid has a density of at least 0.15 gram per milliliter and serves as an effective solvent for the removed liquid hydrocarbons; and lowering said temperature or pressure or both, to thereby make the water in the water-containing fluid a less effective solvent for the removed liquid hydrocarbons and to thereby form separate phases.

4,151,069
OLEFIN-DICARBOXYLIC ANHYDRIDE COPOLYMERS AND ESTERS THEREOF ARE DEWAXING AIDS

Albert Rossi, Warren, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

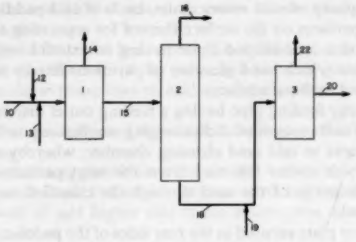
Filed Oct. 17, 1974, Ser. No. 515,564
Int. Cl.[2] C10G *43/06, 43/08*
U.S. Cl. 208—33 1 Claim

1. In a solvent dewaxing process for the separation of wax from a distillate lubricating oil fraction having about 5 to 30 weight percent wax, by the steps which include diluting the oil with solvent, chilling the diluted oil to a temperature in the range of −7° C. to −40° C. to form solid wax crystals and filtering to remove said wax crystals; the improvement which comprises incorporating into said oil prior to formation of said wax crystals a wax crystallization modifying amount of an oil-soluble dewaxing aid copolymer having a number average molecular weight in the range of about 1500 to 20,000, said copolymer consisting essentially of 1-olefin of 30 to 50 carbon atoms copolymerized in essentially equi-molar proportions with maleic anhydride.

4,151,070
STAGED SLURRY HYDROCONVERSION PROCESS

David E. Allan, and William E. Lewis, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 20, 1977, Ser. No. 862,341
Int. Cl.[2] C10G 13/06, 37/02
U.S. Cl. 208—59 6 Claims



1. In a slurry hydroconversion process which comprises:
(a) treating a slurry of the hydrocarbonaceous oil and particulate catalytic solids in the presence of hydrogen, in a first hydroconversion zone;
(b) separating from the resulting first hydroconversion zone effluent, in a separation zone, at separation conditions, at least a heavy oil comprising at least a portion of said catalytic solids;
(c) passing solely at least a portion of said heavy oil comprising said portion of said catalytic solids to a second hydroconversion zone;
(d) treating said heavy oil in the presence of hydrogen in said second hydroconversion zone; and
(e) removing the resulting hydroconverted oil from said second hydroconversion zone, the improvement which comprises: maintaining said first hydroconversion zone at relatively mild hydroconversion conditions; maintaining said second hydroconversion zone at relatively more severe conditions than the conditions of said first hydroconversion zone, said relatively more severe conditions including a temperature ranging from about 800° to about 860° F.; a pressure ranging from about 1000 to about 4000 psia and a liquid hourly space velocity ranging from about 0.1 to about 0.4; separating said hydroconversion zone normally liquid effluent at a distillation cut point ranging from about 975° to about 1050° F., said heavy oil separated in step (b) being the fraction boiling above said cut point, said separation conditions including a temperature ranging from about 650° to about 800° F. and a pressure ranging from about 0.2 to about 2 psia.

4,151,071
DEHYDROCYCLIZATION PROCESS

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

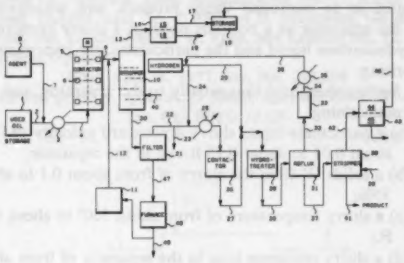
Filed Jul. 26, 1977, Ser. No. 819,028
Int. Cl.[2] C07C 15/02; B01J 23/04, 23/26
U.S. Cl. 208—135 9 Claims

1. A process for the conversion of nonaromatic hydrocarbons to aromatic hydrocarbons which comprises contacting a hydrocarbon-containing feedstock comprising aliphatic hydrocarbons under dehydrocyclization conditions of temperature and pressure with a catalyst consisting of alumina having a surface area of at least 50 m^2/g promoted with an alkali metal oxide selected from the group consisting of the oxides of sodium, potassium, rubidium, and cesium wherein the catalyst contains (1) about 2–14 weight percent of sodium or potassium or (2) about 3–18 weight percent of rubidium or cesium.

4,151,072
RECLAIMING USED LUBRICATING OILS

Gerhard P. Nowack; Donald C. Tabler, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 797,212, May 16, 1977, abandoned. This application Oct. 3, 1977, Ser. No. 838,773
Int. Cl.[2] C10M 11/00
U.S. Cl. 208—182 12 Claims



1. A process for the production of an essentially pure lube oil stock from a used lubricating oil containing ash-forming and additive components which comprises:
(a) contacting said used lubricating oil with an aqueous solution of a treating agent consisting essentially of an ammonium salt selected from the group consisting of ammonium sulfate, ammonium bisulfate, ammonium phosphate, diammonium hydrogen phosphate, ammonium dihydrogen phosphate and mixtures thereof, said treating agent being present in an amount at least sufficient to react with essentially all of the metal constituents in said used lubricating oil, wherein said contacting is carried out at a temperature in the range of from 60° to 120° C. and a pressure in the range of 1 atmosphere to 250 psia and wherein said agent is kept in contact with said used lubricating oil for a time sufficient to disperse said agent in said used lubricating oil and to react said agent with essentially all the ash-forming metal components of said used lubricating oil;
(b) removing a major portion of water and light hydrocarbon components from the resulting aqueous reaction mixture from step (a) by maintaining said mixture at a temperature in the range of 110° to 140° C. and a pressure in the range of 5 to 25 psia for a period of time sufficient to effect removal of a major portion of water and light hydrocarbons therefrom;
(c) separating the oil phase from the residual mixture consisting essentially of used lubricating oil and reacted treating agent resulting from step (b) by filtration;
(d) heating the resulting filtered oil from step (c) to a temperature in the range of 200° to 480° C.;
(e) contacting the resulting heated oil from step (d) with at least one adsorbent selected from the group consisting of activated carbon, silica gel, clay, bauxite and alumina in a contacting zone;
(f) hydrotreating the resulting oil from step (e) by contacting said oil with hydrogen and a hydrotreating catalyst at a temperature in the range of 200° to 430° C. and at a pressure in the range of 150 to 3000 psia;
(g) stripping the resulting hydrotreated oil from step (f) in a stripping zone maintained at a temperature in the range of about 280° to 395° C. and at a pressure in the range of atmospheric to 50 psia; and thereafter
(h) recovering the resulting stripped oil from said stripping zone as a product of the process.

4,151,073
PROCESS FOR PHASE SEPARATION

Alfred G. Comolli, Yardley, Pa., assignor to Hydrocarbon Research, Inc.

Filed Oct. 31, 1978, Ser. No. 956,534
Int. Cl.[2] C10G 9/16, 1/06
U.S. Cl. 208—340 7 Claims

1. In a continuous process of separating a gaseous phase from a hydrocarbon liquid containing particulates and gases comprising feeding the liquid to about the middle portion of a cylindrical separator, removing the gaseous phase from the separator as an overhead vapor product, and withdrawing from the separator as a bottoms product a slurry comprising the hydrocarbon liquid and the particulates, the improvement comprising:

(1) feeding the liquid tangentially to the separator; and

(2) maintaining

(a) a particulate-liquid slurry downward velocity of from about 0.01 to about 0.25 ft/sec in the separator;

(b) a solids W % in the slurry of from about 0.1 to about 30%;

(c) a slurry temperature of from about 550° to about 900° F.;

(d) a slurry residence time in the separator of from about 30 to about 360 seconds; and

(e) a length/diameter ratio for the separator of from about 20/1 to about 50/1,

so that the characterization fractor, α, defined as

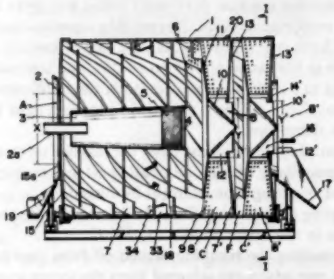
$$\alpha = \frac{\text{slurry residence time (sec)}}{\text{slurry downward velocity (ft/sec)}} \times \frac{\text{wt \% solids} \times \text{slurry temperature (R°)}}{10^6}$$

does not exceed about 48 ° R sec^2/ft.

4,151,074
WET-TYPE SAND CLASSIFIER

Takuo Mohri, Miyazaki, Japan, assignor to Akae Kikai Kogyo Co. Ltd., Miyazaki, Japan

Filed Jun. 20, 1977, Ser. No. 808,217
Int. Cl.[2] B03B 5/56
U.S. Cl. 209—44 8 Claims



1. A wet type sand classifier comprising

a rotary drum having a supernatant water outlet at the front end thereof and a classified sand outlet at the rear end thereof,

a feeding means for feeding muddy water containing said sand into said drum, said feeding means being enclosed concentrically within said drum and attached to said drum for rotation with said drum,

a transferring means for transferring sand settled onto the bottom of said rotary drum toward the rear portion of said drum, said transferring means comprising a plurality of helicoid blades fixedly secured to the inner wall of said drum,

a plurality of rows of sand discharging mechanisms disposed at the rear end portion of said rotary drum, the rearmost discharging mechanism including said rear classified sand outlet, each pair of sand discharging mechanisms forming a sand cleaning chamber therebetween, each of said sand discharging mechanisms comprising a plurality of water separation paddles radially disposed about the inner periphery of said rotary drum, each of said paddles having apertures on the surface thereof for separating the water, and a cone-shaped chute having an exterior inclined surface which has a plurality of partitions fixedly secured to said inclined surface,

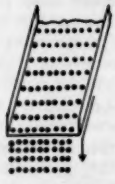
a water feeding pipe having a feeding outlet disposed at one of said rows of sand discharging mechanisms to feed clean water to said sand cleaning chamber, whereby said clean water cleans the mud from the sand particles prior to discharge of the sand through the classified sand outlet, and

a weir plate secured to the rear sides of the paddles, said weir plates each having a central opening, the diameters of each of said central openings of said weir plates being less than the diameter of said supernatant water outlet at the front end of the drum, such that the water in the sand cleaning chamber which contains mud components passes from the cleaning chamber towards the front end of the drum.

4,151,075
SEPARATION OF COMPONENTS OF A FLUID MIXTURE

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Filed Jun. 11, 1976, Ser. No. 694,954
Int. Cl.[2] C02C 1/06
U.S. Cl. 210—7 41 Claims



1. The process of separation of the phases of a fluid mixture comprising at least two phases of matter, a first less dense phase and a second more dense phase, comprising the steps of:

(a) feeding said fluid mixture through a settling device comprising a flow path therewithin; said flow path consisting of a plurality of imperforate channels with open ends formed by the imperforate portions of the inner walls of said device and a plurality of generally parallel imperforate plates having a first axis oriented in the general direction of flow and a second axis oriented transversally to the general direction of flow; said first axis being at a first inclination of about 15° to 75° with a horizontal plane, and said second axis being at a second inclination of about 1° to 20° to the horizontal plane; each channel of said plurality of channels being the space between two adjacent plates of said plurality of plates, an upper plate and a lower plate, said upper plate being not less than one half inch distant from said lower plate; and because of said second inclination of said plates, each of said channels between two of said plates has a first, low side and a second high side;

(b) during the flow of a part of said fluid mixture in said channel, and because of the greater influence of gravity on said more dense phase than on said less dense phase, said more dense phase:

(i) settles downwardly and approaches the lower of said two plates;

(ii) flows at an angle which is not parallel with said first axis of said channel, but which veers toward and approaches the wall of said lower side of the entire cross section of said channel;

(iii) loses some part of said less dense plate mixed therewith during its settling downwardly as it approaches said lower plate of said channel and also in its flow toward and approach to said lower side of the entire cross section of said channel;

(c) during said flow of at least a part of said fluid mixture in said channel, and because of the lesser influence of gravity on said less dense phase than on said more dense phase, said less dense phase:

(i) settles upwardly and approaches the upper of said two plates;

(ii) flows at an angle which is not parallel with said first axis of said channel, but which veers toward and approaches the wall of said higher side of the entire cross section of said channel;

(iii) loses some part of said more dense phase mixed therewith during its settling upwardly as it approaches said upper plate of said channel and also in its flow toward and approach to said higher side of the entire cross section of said channel; and

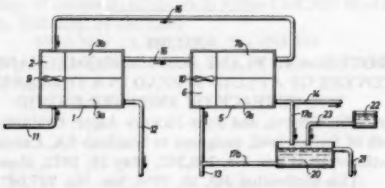
(d) two streams thus are separated and are discharged from each of said channels: a first stream more concentrated than said original mixture in said less dense phase, and a second stream more concentrated than said original mixture in said more dense phase; the sum of the materials leaving said open ends of said channel being equal to that of the entire amount of said fluid mixture which enters said channel.

4,151,076

METHOD OF ELIMINATING THE INFLUENCE OF SURFACTANTS ON THE SEPARATION PROPERTIES IN LIQUID EXTRACTION SYSTEMS

Hans Reinhardt, Västra Frölunda, and Bengt T. Tröeng, Vålberg, both of Sweden, assignors to Svenska Rayon Aktiebolaget, Sweden

Filed Apr. 14, 1978, Ser. No. 896,190
Claims priority, application Sweden, Apr. 15, 1977, 77043578
Int. Cl.[2] B01D *11/04*
U.S. Cl. 210—21 **6 Claims**



1. A method of removing by means of a liquid extraction, dissolved materials, preferably metal ions, from an aqueous feed solution containing extractable surfactants, which comprises:

(a) contacting in at least one extraction step, the aqueous feed solution with an organic solution so as to partly extract the materials into the organic solution, the extraction being performed in the presence of the surfactants;

(b) contacting in at least one re-extraction step, the organic solution, containing extracted materials, with an aqueous washing solution so as to transfer the materials from the organic solution into the washing solution, to the formation of:

(i) an aqueous product solution, which is recovered while partially being recycled as the washing solution, and

(ii) an organic solution depleted of said materials, which is recycled to the extraction step; and

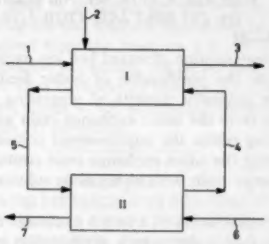
(c) removing the surfactants in connection with the re-extraction step, at least from that part of the product solution which is recycled as the washing solution.

4,151,077

PROCESS FOR ELIMINATION OF MERCURY FROM INDUSTRIAL WASTE WATERS BY MEANS OF EXTRACTION WITH SOLVENTS

Eduardo D. Nogueira, Avda. Mediterraneo No. 47; Angel L. R. Abad, Gabriel Ruiz No. 7; Manuel B. Muntadas, Gil de Andrada No. 12, and Jose M. R. Vega, San Ernesto No. 12, all of Madrid, Spain

Filed Apr. 26, 1977, Ser. No. 791,004
Claims priority, application Spain, Apr. 28, 1976, 447.417
Int. Cl.[2] B01D *11/00*
U.S. Cl. 210—21 **14 Claims**



1. A process for eliminating mercury from industrial waste water by means of solvent extraction, said process comprising the steps of:

firstly, treating the industrial waste water with an oxidizing agent to transform all mercury to mercury species with valence Hg^{++};

secondly, reducing the excess oxidizing agent in the industrial waste water by treatment with a reagent selected from the group consisting of sulphites, bisulphites, hyposulphites, and metabisulphites to form sulphate species which will not degrade an extracting agent;

thirdly, treating the industrial waste water with an organic solution containing an an extractant selected from the group consisting of thioalcohol, thiophenol, thiophene of molecular weights greater than 80 and combinations thereof; a modifier selected from the group consisting of alkylphosphoric esters, oxides of phosphine, fatty alcohols of molecular weights greater than 100 and combinations thereof; and a diluent constituted by mixtures of hydrocarbons similar to kerosene; and

regenerating the extracting agent by treatment with an aqueous solution of chloride ions to recover the mercury in high concentrations of mercuric chloride in an aqueous solution, and to allow recycling of the extracting agent for further loading with the industrial waste water.

4,151,078

REMOVING OIL FROM WATER

Donald W. Calvin, Zachary, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 730,556, Oct. 7, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,003
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—30 A **4 Claims**

1. A method for separating oil from water comprising, in sequence, the steps of

adding to an oil-containing body of water an amount of finely-divided silica, said silica being characterized as

containing sorbed HF valus which render the silica hydrophobic,

the amount of said silica being an amount sufficient to sorb at least a portion of the oil, thereby creating a bouyant layer on the water comprising oil sorbed on hydrophobic silica,

separating the said bouyant layer from the water,

adding the hydrophobic silica containing sorbed oil to a body of water,

allowing the hydrophobic silica to remain in contact with the water until the silica becomes hydrophilic by losing its hydrophobicity, thereby entering into the water phase and releasing the sorbed oil, thus forming an oil layer,

separating the resultant oil layer from the water, and

separating the silica from the water.

4,151,079

REGENERATION OF ION EXCHANGE RESINS

Louis E. Horembala, Burlington, Canada, assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 5, 1978, Ser. No. 912,618

Int. Cl.[2] B01J *1/08;* C02B *1/76*

U.S. Cl. 210—32 **7 Claims**

1. In the regeneration of mixed bed ion exchange resin systems used for the purification of boiler feed water, which regeneration generally consists of separating the cation exchange resin from the anion exchange resin and regenerating said separating resins, the improvement consisting essentially of regenerating the anion exchange resin containing entrained cation exchange resin with an aqueous solution of potassium hydroxide.

4. In the regeneration of a cation exchange resin utilized to purify boiler feed water, which regeneration is normally carried out in place and consists of backwash with high pressure, high temperature condensate followed by brine regeneration with approximately 15 pounds of sodium chloride per cubic foot of resin, the improvement consisting essentially of utilizing potassium chloride in place of sodium chloride whereby sodium leakage is greatly reduced.

4,151,080

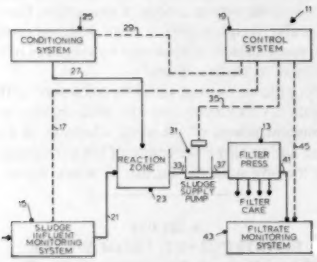
SYSTEM AND APPARATUS FOR CONTROL AND OPTIMIZATION OF FILTRATION PROCESS

Matthew M. Zuckerman, Palo Alto, and Leslie C. Hamer, San Jose, both of Calif., assignors to Enviro Development Co., Inc., Mountain View, Calif.

Filed Feb. 13, 1978, Ser. No. 877,168

Int. Cl.[2] B01D *25/12;* C02B *1/18, 3/06;* C02C *1/40*

U.S. Cl. 210—59 **12 Claims**



1. A process control method of dewatering a solids ladened slurry of water and waste water in a filter press of the kind in which the solids are removed from the slurry and concentrated in the filter press, said method comprising,

feeding an influent solids ladened slurry to an inlet of the filter press,

removing the solids from the slurry in the filter press and concentrating the removed solids within the filter press,

conducting a relatively solids-free effluent from the filter press,

measuring the cumulative volume flow versus time of the effluent from the filter press,

correlating the percent of solids in the influent with the measured cumulative volume flow versus time of the effluent to continuously monitor the solids concentration increase in the dewatering unit, and

measuring the rate of change of solids concentration increase with respect to time within the filter press and generating a resource factor control signal from said measured rate of change of solids concentration increase.

10. A process control method of dewatering a solids ladened slurry of water and waste water in a filter press dewatering unit of the kind in which solids are removed from the slurry and concentrated in the filter press in dewatering cycles, said method comprising,

feeding an influent solids ladened slurry to an inlet of the filter press,

removing the solids from the filter press and concentrating the removed solids within the filter press,

conducting a relatively solids-free effluent from the filter press

measuring the rate of change of solids concentration increase with respect to time within the filter press,

generating resource factor control signal from said measured rate of solids concentration increase,

and terminating the dewatering cycle in response to the attainment of a minimum resource factor signal.

12. A process control apparatus and system for dewatering a solids ladened slurry of water and waste water in cycles in a filter press dewatering unit, said system comprising,

a filter press having an inlet, filter cloth chambers for removing solids from the slurry and for concentrating the removed solids in filter cakes within the filter cloth chambers, and an outlet,

influent feed means for feeding an influent solids ladened slurry to the inlet of the filter press,

effluent means for conducting a relatively solid-free effluent from the filter press,

measuring means for measuring the rate of change of solids concentration increase with respect to time within the filter press and for generating a resource factor control signal from said measured rate of solids concentration increase, and

control means for terminating the dewatering cycle in response to the attainment of a minimum resource factor signal.

4,151,081

PROCESS AND PLANT FOR HYDROMECHANICAL RECOVERY OF A FLUID SPREAD IN A THIN LAYER ON THE SURFACE OF ANOTHER LIQUID

Peter Bolli, Geneva, and Jean-Jacques Asper, Croix-de-Rozon, both of Switzerland, assignors to Seaclean SA, Luxembourg

Continuation of Ser. No. 258,242, May 31, 1972, abandoned. This application Jul. 20, 1976, Ser. No. 707,047

Claims priority, application Switzerland, Jun. 4, 1971, 819571/71

Int. Cl.[2] E02B *15/04*

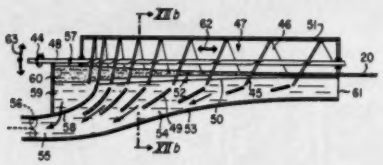
U.S. Cl. 210—83 **26 Claims**

1. An apparatus, for hydromechanical recovery of a contaminant spread in a thin layer on the surface of a liquid immiscible with the contaminant, comprising:

an elongated hollow housing having a major length dimension and open at one end and having at least one aperture therethrough along a bottom portion thereof, said elongated housing being partially immersible in use in a body of liquid with its major length dimension generally horizontal for enclosing a volume of liquid within said hollow housing and with said aperture totally immersed in the body of liquid;

partitioning means for partitioning the interior of said hous-

ing into a series of compartments which progressively advance along the length of said housing from the open end while simultaneously progressively decreasing in volume as they advance along the length of said housing, said partitioning means defining said compartments open opposite said aperture to provide communication through said aperture between the interior of said compartments and the exterior of said housing to allow fluid entrained within respective ones of said compartments progressively decreasing in volume to flow out of said housing through said aperture for progressively decreasing in each of said respective compartments the volume of liquid entrained therein as said respective compartments are advanced along the length of said housing, said aperture having dimensions effective for flowing therethrough



sufficient amounts of underlying liquid from the progressively decreasing in volume advancing compartments to maintain an upper surface of the enclosed contaminant entrained within said compartments at a substantially constant level, and said compartments extending to a depth exceeding the contaminant and the liquid so that the contaminant layer entrained within said compartments progressively thickens as the volumes of the respective compartments decrease and the underlying liquid is discharged through said aperture to facilitate recovery of the contaminant from the surface of the liquid enclosed within said housing; and

means defining a recovery chamber at an end of said housing opposite said open end for receiving the thickened contaminant layer for holding the same while it is being recovered from the surface of the underlying liquid.

4,151,082

SETTLING UNIT FOR CIRCULATED COKE QUENCHING WATER

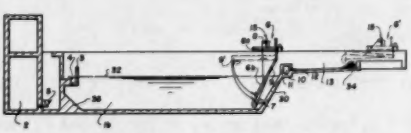
Josef Stratmann, and Manfred Strobel, both of Recklinghausen, Fed. Rep. of Germany, assignors to Firma Carl Still Recklinghausen, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,298

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 7637032[U]

Int. Cl.[2] B01D *21/18, 21/24*

U.S. Cl. 210—83 **6 Claims**



1. A settling unit for coke quenching water which is circulated in a closed cycle, comprising at least one substantially rectangular longitudinally elongated settling basin having a flat bottom, substantially vertical side walls on each side, one first end wall, and a second end wall on the opposite end from said first end wall being slightly inclined from the vertical, a drain surface alongside and sloping toward said second end wall, conduit means adjacent said second end wall having a discharge coextensive in length with said second end wall for directing coke fines and coke dust suspended in a quenching water downwardly on said second end wall into said basin along the entire width of said second end wall and said basin, a trackway extending along the length of said basin and overlying said basin and said drain surface, a dredger carriage movable along said trackway, a support arm pivoted to said dredger carrier and extending downwardly into said basin to a location adjacent the bottom thereof, a bucket pivotally mounted on said arm and being engageably along the bottom upon movement of said carriage to scrape the solids collected in the basin along said bottom of said second end wall and to said drain surface.

6. A method of treating a quenching water after it is used to quench coke for recirculating back for use in quenching additional coke, using a basin having an end wall with a shovel movable along the end wall to scrape the solids out of the basin and dump them on a drain alongside the end wall of the basin, and a conduit arranged adjacent the end wall comprising discharging the quenching water containing solids and water through the conduit along the entire length of the conduit over the end wall and into the basin, continuously removing the solids from the basin by dragging the solids along the bottom of the basin and up the end wall and depositing the solids with any liquid removed from the basin on a drain which drains back into the conduit, permitting the liquid to drain into the conduit and then flow backwardly into the basin and continuously remove the solids which accumulate on the drain after the liquid has run off the solids.

4,151,083

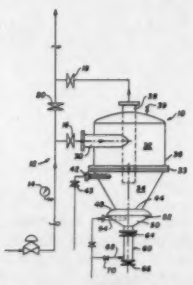
APPARATUS AND METHOD FOR SEPARATING HEAVY IMPURITIES FROM FEED STOCK

Norman F. Dove, 555-1155 W. Georgia St., Vancouver, British Columbia, Canada (V6E 3H4)

Continuation-in-part of Ser. No. 657,414, Apr. 9, 1976, abandoned, which is a continuation of Ser. No. 504,774, Sep. 10, 1974, abandoned. This application Feb. 24, 1978, Ser. No. 880,730

Int. Cl.[2] B04C *5/103, 5/04*

U.S. Cl. 210—84 **14 Claims**



1. Apparatus for removing heavy impurities from feed stock, comprising

a primary classifying chamber having an upper section of circular cross section and a downwardly-converging conical lower section,

a central stock outlet pipe extending upwardly through said upper section of the primary chamber and terminating in an end in the lower section thereof spaced a substantial distance from the conical section wall,

an outlet in the lower end of the lower section,

an inlet pipe for directing feed stock containing heavy impurities tangentially into said chamber upper section to create a vortex flow in the primary chamber, said heavy impurities being separated outwardly by centrifugal force from feed stock being directed to said outlet pipe by centripetal force, said centripetal force being minimal in the

upper section and said centrifugal force being maximal in the lower section,

a secondary classifying chamber connected to the lower end of said lower conical section to receive the heavy impurities with feed stock therefrom, said secondary classifying chamber having a substantially unobstructed inlet and being formed with an upper section abruptly increasing the diameter directly from said conical lower section of the primary classifying chamber in a downward and lateral direction to a maximum cross sectional area rapidly to reduce the velocity of the vortex flow of the stock and impurities therein, said upper section of the secondary classifying chamber having a substantially greater inclination from the vertical than said conical lower section of the primary classifying chamber, said upper section of the secondary classifying chamber lying at an acute angle with respect to the conical lower section of the primary classifying chamber, and a lower conical section of the secondary classifying chamber converging from said maximum cross sectional area to an outlet controlled by a valve, and

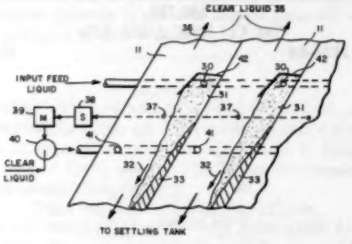
means for directing a diluent tangentially into the reduced velocity stock in the secondary classifying chamber in a direction counter to the movement of said stock further to dilute the stock to assist separation of the heavy impurities by gravity and to return lighter valuable components of the stock to the primary chamber.

4,151,084

LAMELLA SEPARATORS

Ronald F. Probstein, Brookline, Mass., and David Yung, Woodridge, Ill., assignors to Water Purification Associates, Cambridge, Mass.

Filed Oct. 6, 1977, Ser. No. 839,782
Int. Cl.² B01D *21/24*
U.S. Cl. 210—97 **11 Claims**



1. Apparatus for separating solid material from feed fluid containing said solid material, said apparatus comprising

a plurality of parallel, inclined channels each channel having a lower surface;

means for feeding said feed fluid into each of said channels at a preselected region thereof, said solid material generally settling along an inclined surface of each of said channels and said feed fluid forming a layer thereof generally extending from said preselected region along a first direction and flowing in said first direction in each said channel, fluid which is clear of said solid material generally flowing through each said channel in a second direction opposite to said first direction, a portion of said feed fluid tending to flow in said second direction when the thickness of said input feed fluid layer approaches or exceeds about one-half the depth of said channel;

control means effective during operation of said apparatus for maintaining the thickness of said feed fluid layer in the region adjacent the lower surface of each channel at less than one-half the depth of said channel at said preselected region and substantially along the length of said channel to prevent any substantial flow of said feed fluid in said second direction and thereby to prevent the solid material which is contaminating the clarified layer from being entrained by said clear fluid output;

means for removing said clear fluid at one end of each of said channels; and

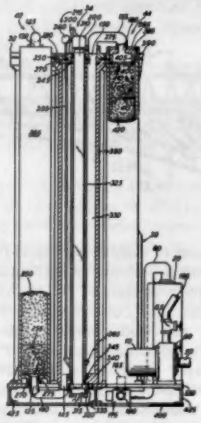
means for removing said solid material at the other end of each of said channels.

4,151,085

WATER PURIFICATION SYSTEM

Lionel W. Malik, 7044 S. Cornell Ave., Chicago, Ill. 60649

Filed Apr. 3, 1978, Ser. No. 892,955
Int. Cl.² B01D *35/06*
U.S. Cl. 210—101 **14 Claims**



1. A water purification system comprising:

a plurality of germicidal filters;

a plurality of mechanical filters;

flow measurement and control means; electrical means;

the members of said plurality of germicidal filters and the members of said plurality of mechanical filters being connected operably in series, with each of said members of said plurality of germicidal filters being alternately and operatively connected to at least one of said members of said plurality of mechanical filters, said alternating connection of germicidal and mechanical filters being further interconnected to said flow measurement and control means; said flow measurement and control means being operable to sense and regulate the rate of flow through said interconnected plurality of germicidal filters and said plurality of mechanical filters to achieve the optimal purification effect from each of said filter units; said electrical means being operably connected to at least said plurality of germicidal filters.

4,151,086

FLUID SAMPLE COLLECTION AND DISTRIBUTION SYSTEM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Richard L. Brooks, Conroe, Tex.

Filed Apr. 4, 1978, Ser. No. 893,382
Int. Cl.² B01D *23/24*
U.S. Cl. 210—108 **18 Claims**

1. Apparatus for collecting and distributing an aqueous fluid from a plurality of points along a fluid flow path, comprising:

collecting means for continuously collecting said aqueous fluid from at least one of said plurality of collection points along the fluid flow path;

filter means for receiving said collected aqueous fluid and

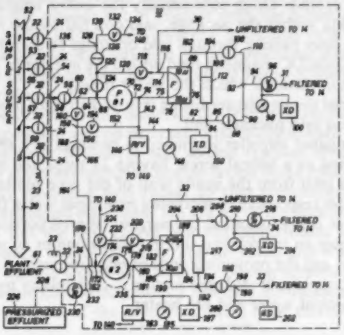
filtering a portion of said fluid to provide a plurality of filtered sources of the aqueous fluid;

means cooperating with said filter means for providing a source of unfiltered aqueous fluid from a portion of said collected aqueous fluid;

valve means cooperating with said filtered sources of aqueous fluid for periodically halting the flow of one of said filtered sources of the aqueous fluid;

piston means cooperating with said valve means and said filter means for backflushing the filter associated of said first filter means without disrupting the flow of said other sources of filtered aqueous fluid;

first signal generating means for generating first electrical signals representative of the pressure of the unfiltered aqueous fluid after said collecting step but prior to said filtering step;



second signal generating means for generating second electrical signals representative of the pressure of said filtered aqueous fluid in said plurality of filtered sources;

process control means communicating with said apparatus for receiving said first and second electrical signals and for generating and applying thereto electrical command signals for controlling the sequence of operation of each of said means, said collecting means comprising;

inlet means cooperating with said fluid flow path and responsive to command signals from said process control means for admitting said aqeuous fluid from at least one of said plurality of collection points along the fluid flow path; and

a pump interconnected to said valve means and responsive to command signals from said process control means for continuously pumping said aqueous fluid from at least one of said plurality of collection points along the fluid flow path.

4,151,087

OILY-WATER SEPARATOR

Jun Sakaguchi, No. 51-G, Yaguchidai, Naka-ku, Yokohama-shi, Yokohama, Japan

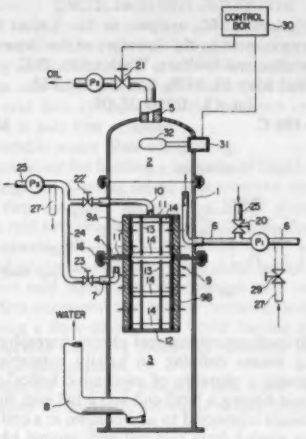
Filed Jul. 11, 1977, Ser. No. 814,576

Claims priority, application Japan, Jul. 12, 1976, 51-91644[U]

Int. Cl.² B01D *17/02*

U.S. Cl. 210—109 **5 Claims**

1. An oily-water separator comprising a vessel having at least one partition wall for separating an interior of said vessel into at least an upper and a lower chamber and at least one generally cylindrical filter device disposed within said vessel and extending into both said upper and lower chambers, said filter device having an upper and lower end closed by an upper plate having an opening and a lower plate, respectively, an oily water supply pipe connected to said upper chamber, a first oil outlet connected to a top portion of said upper chamber, a second oil outlet connected to said opening of said upper plate of said filter device, a third oil outlet connected to an upper portion of said lower chamber and a water outlet connected to a lower portion of said lower chamber and a first pump means



connected to said oily water supply pipe for supplying, under pressure, water containing oil to said upper chamber.

4,151,088

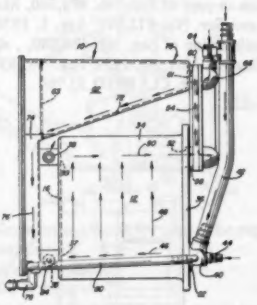
MEMBRANE DIFFUSION DEVICE WITH INTEGRAL HEAT EXCHANGER AND RESERVOIR

Ludwig Wolf, Jr., Crystal Lake, and Walter L. Carpenter, Richmond, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 23, 1978, Ser. No. 871,269

Int. Cl.² B01D *31/00*; A61M *1/03*

U.S. Cl. 210—180 **12 Claims**

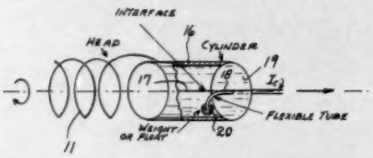


1. In a diffusion system for blood, a membrane diffusion device comprising a plurality of first blood flow paths positioned in interleaving, diffusion exchange relation with a plurality of second fluid flow paths on opposite sides of semipermeable membrane means, said first and second flow paths each communicating with an inlet and outlet; heat exchange means having an inlet and an outlet, and means communicating the outlet of said first flow paths with the inlet of said heat exchange means; a rigid reservoir having an inlet and an outlet, and means communicating the outlet of said heat exchange means with the inlet of said reservoir, to define a blood flow circuit through said membrane diffusion device, heat exchange means, and reservoir; said blood flow circuit defining an essentially constant width, perpendicular to the directions of blood flow from its beginning to end.

4,151,089
DEVICE FOR HIGH EFFICIENCY CONTINUOUS COUNTERCURRENT EXTRACTION USING A ROTATING HELICAL TUBE

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed May 17, 1978, Ser. No. 906,868
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C 13 Claims

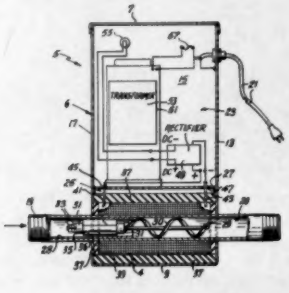


1. A flow-through countercurrent chromatography apparatus comprising means defining an axially rotatable helical column comprising a plurality of successive helical-chamber coil elements and having a head end and a tail end, first phase feed conduit means connected to said column at a coil element adjacent to but spaced from said tail end, second phase feed conduit means connected to said column at a coil element adjacent to but spaced from said head end, second phase collection conduit means connected to the tail end of the column, and first phase collection conduit means connected to the head end of the column, said first phase collection conduit means including gravimetric phase separation means for separating the phases in accordance with their densities, and output conduit means connected to said gravimetric phase separation means for eluting a selected separated phase from said gravimetric phase separation means.

4,151,090
UNITARY PACKAGE FOR WATER TREATMENT FOR ATTACHMENT TO HOME HOT WATER HEATER

Miguel F. Brigante, 16550 NW. 10th Ave., Miami, Fla. 33169

Continuation-in-part of Ser. No. 474,580, May 30, 1974, abandoned, and Ser. No. 672,819, Apr. 1, 1976, abandoned, which is a continuation of Ser. No. 474,580, , abandoned. This application Nov. 30, 1977, Ser. No. 855,951
Int. Cl.[2] B01D *35/06*
U.S. Cl. 210—222 14 Claims



1. A unitary special package for attachment to a home hot water heater between a municipal water line and the water inlet of the heater comprising:

a package casing having a top, a bottom and sides therebetween enclosing electrical conversion AC to DC machinery and an electromagnetic assembly about a straight pipe section in the package adapted for water treatment inside the casing;

an upper compartment immediately below the top of said casing in which is mounted a step-down transformer converting 110–220 volts to 24 ± 4 volts AC, a plug and lead from AC house current to 110–220 volts AC into said transformer, and a DC rectifier converting said 24 volt input into a DC output for energizing a coil in a lower compartment of the package;

a lower compartment containing a straight pipe section between the casing sides which projects from the sides and thus forms a straight line for direct connection between the municipal water line and the inlet line to the hot water heater;

a horizontal wall provided with openings separating said upper and lower compartments and electrical lead lines passing through said openings between the rectifier and the coil;

said straight pipe section being surrounded by a magnet wire winding consisting of aluminum wire which is insulated and extends along substantially the entire length of said section within the package, said coil fed by the electrical lead lines passing through said openings to thereby create a 24 volt DC magnetic field within the interior of said pipe section through which the water flows;

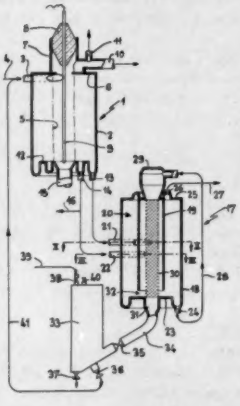
a tapered sleeve adapter fitting into said straight pipe section within said package; and

an elongated impeller journaled in bearings in a spider and formed as a helical screw having 2¼ turns and spaced at 1/16 inch from the inside wall of the pipe section which rotates responsive to incoming municipal water flow, said spider being locked at the narrow tapered portion of said adapter to immobilize the impeller counter to water inflow, and the projecting ends of said pipe section adapting the coupling of said pipe section in said unitary package to municipal water and the heater.

4,151,091
APPARATUS FOR SEPARATING SOLID POLLUTANTS FROM FLUIDS

Jean-François Vicard, Lyon, France, assignor to Societe Lab, Rhone, France

Division of Ser. No. 581,519, May 28, 1975, Pat. No. 4,017,390. This application Jan. 7, 1977, Ser. No. 757,534
Claims priority, application France, Jun. 7, 1974, 74 20622
Int. Cl.[2] C02B *1/82*
U.S. Cl. 210—243 2 Claims



1. Apparatus for treating a liquid introduced under high pressure and having solid particles suspended therein by agglomerating the particles and centrifuging the liquid to deliver at separate outlets a first fraction of the liquid having a greater particle concentration and a second fraction of the liquid having a lesser particle concentration, comprising:

a hollow vertically oriented cylindrical body having a pe-

ripheral wall and having upper and lower ends substantially closed by end walls and having an axis, the lower end wall of the body having a first annular recess located adjacent to said peripheral wall and having a second annular recess concentric with the first annular recess and spaced therefrom toward said axis;

an elongated electrode disposed within said cylindrical body and extending the full length of the body along the axis, said electrode being supported in insulated relationship with respect to said cylindrical body and having means to apply a high voltage to the electrode to create an electrical field with respect to the body;

an inlet extending into the cylindrical body near its upper end, the inlet being disposed tangentially to the peripheral wall to make the liquid introduced therein under high pressure whirl within the body to form a revolving liquid mass having an empty vortex in its center into which the electrode extends out of contact with the liquid;

a first outlet leading downwardly from said first annular recess and located adjacent to the peripheral wall of the body to deliver said first fraction of liquid of higher concentration;

a second outlet leading downwardly from said second annular recess and spaced from said first outlet toward the axis of the body to deliver said second fraction of liquid of lesser concentration, the second recess being spaced sufficiently from the first recess so that the second recess delivers liquid taken near the vortex of the rotating liquid mass and the first recess delivers liquid taken near the peripheral wall of the body, and the lower end wall of the body having a central discharge opening located beneath the electrode and of diameter less than the diameter of the empty vortex of the revolving liquid mass thereadjacent; and

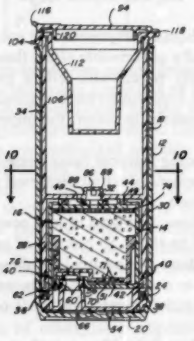
the upper end wall of said body having a central opening of diameter less than the diameter of the empty vortex of the revolving liquid mass thereadjacent, said axial opening being connected to an overflow pipe vented to the outside through which gases liberated from the liquid can escape.

4,151,092

PORTABLE WATER FILTER

Thomas Grimm, Ft. Collins, and Douglas Ewald, Greeley, both of Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Jul. 11, 1977, Ser. No. 814,485
Int. Cl.[2] B01D *27/02, 33/00*
U.S. Cl. 210—256 **27 Claims**



1. A portable water filter comprising:

a first upright cylinder closed at one end and open at the other end;

a second upright cylinder telescopingly receivable within said first cylinder through said other end;

means, including a transverse wall spaced upwardly from the lower end of said second cylinder, disposed in and forming a part of the lower end portion of said second cylinder for defining a cavity receptive of a cartridge capable of filtering water flow therethrough;

and a cartridge receivable in said cavity and confining a material for filtering water pumped to flow through said cavity and said material as said second cylinder is pressed within said first cylinder, insertion of said second cylinder into said first cylinder creating pressure on liquid contained in said first cylinder.

4. A portable water filter comprising:

a first container for holding a quantity of liquid to be treated;

a cartridge for filtering liquid and mounted with respect to said first container for treating liquid pumped to flow from said first container through filtering material within said cartridge;

a second container coupled to said cartridge and arranged to receive said liquid pumped through said cartridge from said first container, said second container including means defining a flow passage for liquid leaving said cartridge and further including means for diffusing water flowing through said passage;

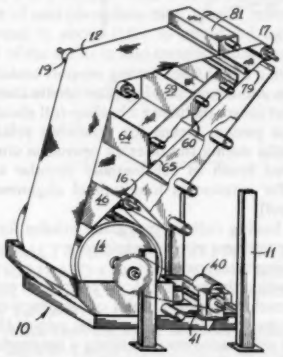
and means for manually pumping said liquid from said first container through said cartridge to said second container.

4,151,093

STOCKWASHER

Milos Krofta, Lenox, Mass., assignor to Lenox Institute for Research, Lenox, Mass.

Filed Mar. 24, 1978, Ser. No. 889,943
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—386 **8 Claims**



1. Apparatus for washing stock for use in the paper, pulp and like industries comprising

a supporting framework,

an endless filter screen,

a compacting drum positioned at the lower end of said framework,

plural washing station means spaced along said framework above said compacting drum,

a screen supporting frame carried by said supporting framework at an inclined angle with respect to horizontal,

means to adjust said inclined angle from about 30° to about 60°,

roller means carried by both said frameworks supporting said endless filter screen along said inclined framework and around said compacting drum, motor means for moving said screen upwardly along said inclined framework,

watered stock inlet means and washing water inlet means positioned over said filter screen and carried by said inclined framework, said washing water means feeding wash water to each of said plural washing station means,

doctor blade means for scraping stock from the top surface of said inclined screen so that said stock is washed and a

portion of the washing water drained by said screen, said washed stock flowing downwardly to be compacted between the under surface of said screen and said compacting roller,

and washed stock removal means positioned above said compacting roller and within the periphery of said endless filter screen.

4,151,094

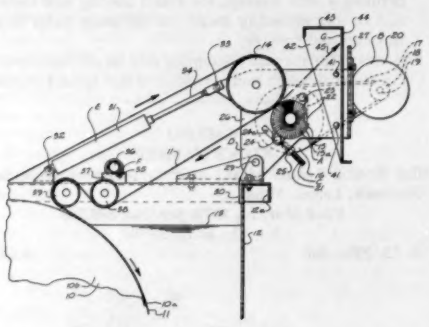
APPARATUS FOR REMOVING SOLIDS FROM FILTER MEDIA

Floyd H. Wyman, Mauldin, S.C., assignor to Thermo Kinetics, Inc., Greenville, S.C.

Continuation of Ser. No. 591,756, Jun. 30, 1975, abandoned, which is a continuation of Ser. No. 319,748, Dec. 29, 1972, abandoned. This application Aug. 15, 1977, Ser. No. 837,305

Int. Cl.[2] B01D *33/14, 33/38*

U.S. Cl. 210—396 **2 Claims**



1. For use in a liquid filter having support means for a sheet of filter media and means moving filter media about said filter on said support means including a backup roll about which said filter media is passed, means for removing solids deposited upon said media during the filtering operation comprising:

an elongated brush of substantially circular cross-section carried for rotation in longitudinal alignment with said backup roll;

said brush having radially extending bristles forming a substantially uniform circular periphery;

means driving said brush;

means adjusting the proximity of a peripheral portion of said brush closely adjacent a point of tangency of said brush with the backup roll and the media passed thereabout so that said solids are removed along a tangential path from said media by a flicking action of the peripheral portion of the brush;

collection means adjacent said brush in said tangential path upon which said solids impinge; and

movable support means carrying said backup roll, brush, said means driving said brush and said adjusting means.

4,151,095

PLEATED FLUID FILTER

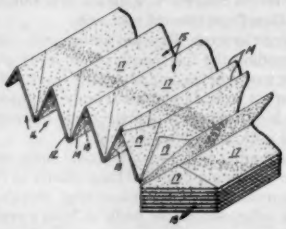
Mervin E. Wright, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jun. 26, 1978, Ser. No. 918,939

Int. Cl.[2] B01D *27/06, 46/02, 46/52;* **B29D** *23/10*

U.S. Cl. 210—443 **12 Claims**

1. A filter comprising an elongated porous sheet of filter material folded on longitudinally spaced transverse fold lines and in alternate directions to provide a plurality of accordion pleats having opposite edges, each pleat having a pair of sides and adjacent pleats being oppositely directed and having a common side, alternate ones of said pleats having a pair of score lines adjacent to at least one of the edges thereof and on said pair of sides thereof, each said pair of score lines extending diagonally from the fold lines of their adjacent pleats at said one of the edges to the fold line of their respective pleat, said alternate pleats being folded upon themselves along their respective diagonal score lines with one side of each alternate



pleat being folded over the other side thereof whereby to close the space between the sides thereof at said one of the edges of each of said alternate pleats.

4,151,096

CLAY-FREE WELLBORE FLUID

Jack M. Jackson, Houston, Tex., assignor to Brinadd Company, Houston, Tex.

Continuation-in-part of Ser. No. 828,347, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 558,815, Mar. 17, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 861,861

Int. Cl.[2] C09K *7/02*

U.S. Cl. 252—8.5 A **6 Claims**

3. A clay-free, non-thixotropic wellbore fluid being devoid of dolomite and having improved viscosity stability consisting essentially of water, at least 1.0% by weight of a soluble salt of potassium, sodium or calcium, a viscosifying amount of guar gum and at least 10 weight percent of magnesia based on guar gum.

4,151,097

LIQUID SYSTEMS

Robert T. Nelson, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 816,681, Jul. 18, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 916,336

Claims priority, application United Kingdom, Jul. 26, 1976, 31070/76

Int. Cl.[2] D06M *13/10*

U.S. Cl. 252—8.6 **21 Claims**

1. An improved liquid composition for use in treating fabrics to impart a sensorially perceivable effect thereto by the deposition of a sensorially perceivable effect producing material thereon and of the type comprising a sensorially perceivable effect producing material in water, the improvement comprising:

said effect producing material being present in said composition as a component of a first dispersed phase dispersed in an aqueous phase, wherein:

(a) said first phase is present in said composition at a level of about 0.5 to about 50 percent of said composition;

(b) said first phase is a particulate phase comprising:

(i) about 25 to about 90 percent by weight of said phase of a substantially water insoluble organic matrix material;

(ii) about 0.5 to about 50 percent by weight of said phase of a cationic material; and

(iii) about 0.5 to about 50 percent by weight of said phase of a sensorially perceivable effect producing material; and

(c) said aqueous phase is present in said composition at a level of about 50 to about 99.5 percent by weight of said composition.

4,151,098

ACIDIZING SUBTERRANEAN WELL FORMATIONS CONTAINING DEPOSITS OF METAL COMPOUNDS

Walter R. Dill, and John A. Knox, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 5, 1978, Ser. No. 866,983
Int. Cl.[2] E21B *43/27*
U.S. Cl. 252—8.55 C 12 Claims

1. A sequestering additive for use in aqueous acid solutions to prevent the precipitation of metal compounds therefrom after being spent said sequestering additive being comprised of a mixture of a first ingredient selected from the group consisting of levulinic acid, a salt of levulinic acid and mixtures thereof, and a second ingredient selected from the group consisting of citric acid, a salt of citric acid and mixtures thereof wherein the weight ratio of said first ingredient to said second ingredient is in the range of from about 5:1 to about 1:5.

4,151,099

WATER-BASED HYDRAULIC FLUID AND METALWORKING LUBRICANT

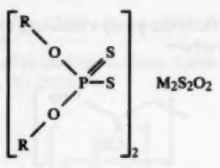
Assadullah Nassry, Riverview, and Jerrold F. Maxwell, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 3, 1977, Ser. No. 756,144
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E 19 Claims

1. A hydraulic fluid or metal working fluid concentrate capable of imparting to water the properties of a lubricant such as resistance to extreme pressure and corrosion inhibition, said concentrate consisting essentially of:

A. a water-soluble polyoxyethylated aliphatic ester consisting of esters of ethoxylated aliphatic monohydric and polyhydric alcohols and ethoxylated aliphatic acids wherein said acids have about 5 to about 20 moles of ethylene oxide added per mole of acid and wherein said alcohols and acids have carbon chain lengths of 8 to 36 carbon atoms and wherein said esters are produced by first polyoxyethylating at least one of said acids or alcohols and second obtaining the ester reaction product thereof,

B. a sulfurized metallic compound of the formula:

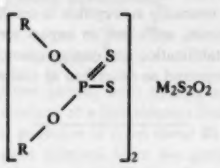


wherein M is molybdenum or antimony and wherein R is selected from the group consisting of alkyl, aryl, alkylaryl radicals and mixtures thereof having 3 to 20 carbon atoms in the alkyl group and wherein the ratio of said water-soluble ester to said sulfurized metallic compound is from 0:5:1 to 2:1 by weight based upon the weight of the sulfur in said metallic compound, and optionally a corrosion inhibitor, or thickener, and a metal deactivator.

8. A hydraulic fluid or metal working fluid concentrate capable of imparting to water the properties of a lubricant such as resistance to extreme pressure and corrosion inhibition, said concentrate consisting essentially of:

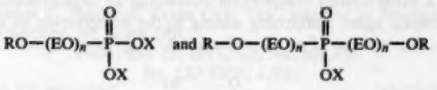
A. a water-soluble polyoxyethylated aliphatic ester consisting of esters of ethoxylated aliphatic monohydric and polyhydric alcohols and ethoxylated aliphatic acids wherein said acids have about 5 to about 20 moles of ethylene oxide added per mole of acid and wherein said alcohols and acids have carbon chain lengths of 8 to 36 carbon atoms and wherein said esters are produced by first polyoxyethylating at least one of said acids or alcohols and second obtaining the ester reaction product thereof,

B. a sulfurized metallic compound of the formula:



wherein M is molybdenum or antimony and wherein R is selected from the group consisting of alkyl, aryl, alkylaryl radicals and mixtures thereof having 3 to 20 carbon atoms in the alkyl group and wherein the ratio of said water-soluble ester to said sulfurized metallic compound is from 0:5:1 to 2:1 by weight based upon the weight of the sulfur in said metallic compound,

C, a phosphate ester salt selected from the group consisting of



and mixtures thereof, wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl groups having about 6 to 30 carbon atoms or alkylaryl groups wherein said alkyl groups have 6 to 30 carbon atoms; X is selected from the residue of ammonia, an amine and an alkali or alkaline earth metal or mixtures thereof, n is a number from 1 to 50 and wherein the proportion of said phosphate ester to said sulfurized metallic compound is about 0.1:1 to about 2:1 based upon the weight of the sulfur in said metallic compound and optionally

D. a corrosion inhibitor, a thickener, and a metal deactivator.

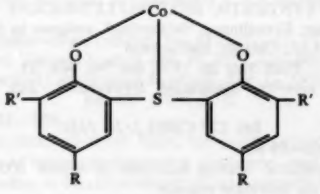
4,151,100

NOVEL COBALT THIOBIS(ALKYLPHENOLATES) AND ANTIOXIDANT COMPOSITIONS THEREOF

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,353
Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 30 Claims

1. A compound derived from Cobalt II and a thiobis(alkylphenol) containing a ratio of one cobalt atom to one molecule of the thiobis(alkylphenolate) having the general structure:



where R and R' are H or an alkyl group having from 1 to about 30 carbon atoms and R' is the same as R except that the carbon atom attached to the ring is connected to no more than 2 carbon atoms.

13. A composition comprising a major proportion of an organic medium normally susceptible to oxidative degradation and a minor amount, sufficient to impart antioxidant properties, ultraviolet stabilization and energy quenching stabilization thereto, of a compound as described in claim 1.

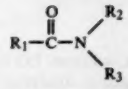
4,151,101

METHOD AND COMPOSITION FOR CONTROLLING FOAM IN NON-AQUEOUS FLUID SYSTEMS

Joseph F. Anzenberger, Sr., New City, and Michael P. Silvon, Mahopac, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

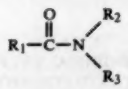
Filed Dec. 23, 1977, Ser. No. 863,551
Int. Cl.[2] C10M 1/10
U.S. Cl. 252—49.6 56 Claims

1. A method of enhancing the foam inhibiting characteristics of a foam control composition containing an organo-silicone antifoam agent comprising adding to the composition an enhancing amount of an alkanolamide having the structure:



wherein R_1 is a hydrocarbon group containing from 6 to 26 carbon atoms, R_2 is an hydroxy substituted alkyl of 1 to 6 carbon atoms and R_3 is hydrogen or hydroxy substituted alkyl of 1 to 6 carbon atoms.

11. An improved non-aqueous fluid composition having a decreased foaming tendency, of the type containing a major portion of a non-aqueous functional fluid which is a synthetic phosphate ester having a tendency to foam and further containing an organo-silicone antifoam agent, wherein the improvement comprises the presence in the composition of an effective amount for decreasing foaming tendency of an alkanolamide having the structure:



wherein R_1 is a hydrocarbon group containing from 6 to 26 carbon atoms, R_2 is an hydroxy substituted alkyl of 1 to 6 carbon atoms and R_3 is hydrogen or hydroxy substituted alkyl of 1 to 6 carbon atoms.

4,151,102

SYNTHETIC BEARING LUBRICANT

Rudolf Baur, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 26, 1978, Ser. No. 909,791
Claims priority, application Switzerland, Jun. 2, 1977, 6767/77
Int. Cl.[2] C10M 1/26, 1/16
U.S. Cl. 252—56 R 11 Claims

1. A synthetic bearing lubricant in which 100 parts by weight of the lubricant contain:

86.9 to 97.5 parts by weight of poly-isobutene;

2.1 to 11.2 parts by weight of at least one ester of a C_2 to C_5 alcohol with an α-hydroxy-monocarboxylic acid or an α-hydroxy-dicarboxylic acid; and

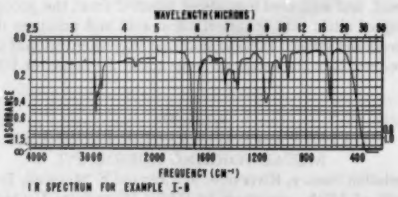
0.4 to 1.9 parts by weight of at least a single or multiple-unsaturated C_{13}— to C_{19}- carboxylic acid.

4,151,103

α-OXY(OXO) SULFIDES AND USES THEREOF IN PERFUMERY AND IN PERFUMED ARTICLES

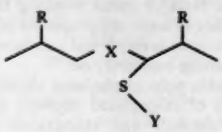
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 819,958, Jul. 28, 1977, abandoned, which is a division of Ser. No. 723,584, Sep. 15, 1976, Pat. No. 4,065,408. This application Mar. 7, 1978, Ser. No. 884,318
Int. Cl.[2] C11D 3/50, 9/44
U.S. Cl. 252—89 R 3 Claims



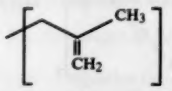
IR SPECTRUM FOR EXAMPLE I-B

1. A process for preparing a perfumed soap comprising intimately admixing soap chips with from 0.005% up to 2% by weight of a compound having the structure:



wherein R is one of hydrogen or methyl, X is the structure:

and Y is selected from the group consisting of methyl, methallyl having the structure:



1-propyl, 2-methyl-1-propyl and acetyl.

4,151,104

BUILT LIQUID BLEACHING COMPOSITIONS

Vincent E. Alvarez, Livermore, and Lodric L. Maddox, Oakland, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Feb. 6, 1978, Ser. No. 875,404
Int. Cl.[2] C11D 7/56
U.S. Cl. 252—99 3 Claims

1. A built aqueous bleaching composition for addition to fabric laundering solutions containing detergents consisting essentially of:

(a) from about 1.5% to about 7% weight of sodium hypochlorite;

(b) from about 0.5% to about 5.5% by weight of an alkali metal orthophosphate buffer where the alkali metal is selected from the group consisting of sodium and potassium and is a tri-alkali metal orthophosphate, wherein the buffer maintains the pH of the composition to fall within

the range from about 11.5 to about 13, and stabilizes the hypochlorite during shelf life;

(c) from about 4.0% to about 20% by weight of an alkali metal pyrophosphate builder where the alkali metal of the pyrophosphate builder is selected from the group consisting of sodium and potassium and is a tetra-alkali metal pyrophosphate, and the builder to buffer weight ratio is not less than 1.5 to 1, and the builder assists the detergent soil removal action of said laundering solution during fabric laundering; and

(d) the balance water.

4,151,105

LOW pH DETERGENT BAR

James R. O'Roark, Dayton, Ohio, assignor to The Hewitt Soap Company Inc., Dayton, Ohio

Continuation of Ser. No. 764,875, Feb. 2, 1977, Pat. No. 4,100,097. This application Apr. 19, 1978, Ser. No. 897,878

The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.

Int. Cl.[2] C11D *1/28, 3/22, 17/00*

U.S. Cl. 252—145 **18 Claims**

1. A milled synthetic detergent bar providing a pH of from about 4 to about 7 at a use concentration of about 1% by weight in water and consisting essentially of (a) from about 20% to about 40% by weight of a synthetic detergent selected from the group consisting of sodium lauryl sulfoacetate and coconut-oil fatty acid ester of sodium isethionate and mixtures thereof; (b) from about 10% to about 30% by weight paraffin; (c) from about 5% to about 15% by weight powdered starch; (d) from about 10% to about 30% by weight dextrin; (e) coconut-oil fatty acid in an amount up to about 5% to improve plasticity of the paraffin and to improve sudsing performance; and (f) from about 8% to about 15% by weight water.

4,151,106

PROCESS FOR THE PREPARATION OF UNIFORM, STABLE DIACYL PEROXIDE COMPOSITION

Guenter Meenen, Emmerich, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

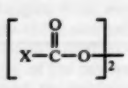
Filed Jun. 23, 1977, Ser. No. 809,597

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628272

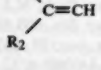
Int. Cl.[2] C07C *179/14;* **C08K** *5/14*

U.S. Cl. 252—186 **3 Claims**

1. A process for preparing uniform, stable pastes of diacyl peroxides having the formula,

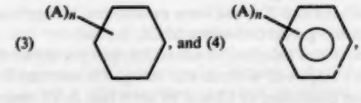


wherein X is selected from the group consisting of (1) alkyl radicals having from about 1 to about 12 carbon atoms,



(2)

wherein R_1 is an alkyl, cycloalkyl or aralkyl radical having from about 2 to about 17 carbon atoms and R_2 is hydrogen or an alkyl radical having from about 1 to about 4 carbon atoms,



(3) , and (4) .

wherein A is an alkyl, cycloalkyl, or aralkyl radical having from about 1 to about 12 carbon atoms or a halogen and n is an integer from 0 through 2, comprising reacting the corresponding acyl chloride having the formula,

wherein X is defined above, with hydrogen peroxide in an alkaline aqueous medium at a temperature from about 0° C. to about 30° C. in the presence of from about 40 to about 70% of a desensitizing agent selected from the group consisting of compositions which have a stabilizing effect on the peroxide but are otherwise essentially inert with respect to reacting with the peroxide, said composition having a flash point of no less than about 100° C., a boiling point of no less than about 150° C., and a solidification point below about 0° C., based on the weight of reacted acyl chloride until a substantial proportion of the diacyl peroxide has been formed, and subsequently isolating the desired paste.

4,151,107

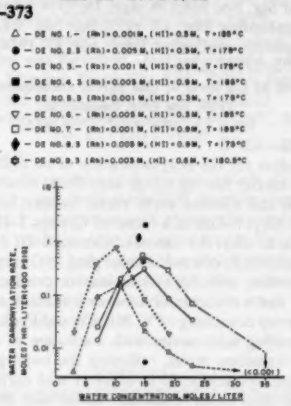
CATALYSIS OF WATER-GAS SHIFT REACTION

Thomas C. Singleton, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed May 31, 1977, Ser. No. 801,954

Int. Cl.[2] C07C *1/02*

U.S. Cl. 252—373 **19 Claims**



1. A process for the reaction of carbon monoxide and water to produce hydrogen and carbon dioxide which comprises contacting carbon monoxide and water in liquid phase in substantial absence of other carboxylatable components with a catalyst consisting essentially of a rhodium or iridium compound and an iodide promoter, and in which the water concentration is controlled to the range of 3 to 25 molar, and recovering gaseous products.

4,151,108

REFERENCE LIQUID FOR BLOOD GAS EQUIPMENT

Soren K. Sørensen, Glostrup, and Carl C. Holbek, Allerod, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Continuation-in-part of Ser. No. 652,817, Jan. 27, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 806,837

Claims priority, application Denmark, Jun. 17, 1976, 2724/76

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—408 **12 Claims**

1. A synthetic reference liquid for quality control and/or calibration of blood gas measuring equipment, said reference liquid showing, at a fixed temperature, a known pH, PCO_2 and PO_2 value, said reference liquid comprising an aqueous phase containing at least one pH buffer system and particles suspended in said aqueous phase, the particles being either (1) polymeric oxygen-permeable microcapsules containing at least one organic liquid which shows a considerably greater ability to reversibly contain oxygen than does water, or (2) particles of porous silicone rubber.

4,151,109

QUATERNARY AMMONIUM CATALYST SYSTEM FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 687,968, May 19, 1976, Pat. No. 4,098,774.
This application May 8, 1978, Ser. No. 903,418
Int. Cl.[2] C08F 4/08
U.S. Cl. 252—428 11 Claims

1. The process of making catalyst for the polymerization of 2-pyrrolidone comprises contacting an alkali metal pyrrolidonate, a tetraalkyl ammonium halide and carbon dioxide in mol ratio 1:0.1–2:0.1–0.5.

4,151,110

ALPHA OLEFIN POLYMERIZATION CATALYST COMPRISING AN ALKYL HALIDE AND A COMBINATION PRODUCT OF $TiCl_3$ AND TRANSITION METAL CHLORIDE OF VANADIUM, MANGANESE, COBALT OR IRON

Sebastiano Cesca, San Donato Milanese; Alberto Greco, Dresano; Guglielmo Bertolini, Pavia, and Mario Bruzzone, San Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., San Donato, Italy

Division of Ser. No. 568,170, Apr. 15, 1975, abandoned. This application Mar. 25, 1977, Ser. No. 781,480
Claims priority, application Italy, Apr. 17, 1974, 21516 A/74; Jan. 10, 1975, 19166 A/75
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] C08F 4/02, 4/64, 4/68
U.S. Cl. 252—429 C 7 Claims

1. A catalyst for the polymerization of an alpha-olefin consisting of a carrier having a high superficial area selected from alkali metal and alkaline earth metal halides; in combination with (a) an alkyl halide of a metal of Groups I–III of the periodic system, an alkyl derivative of Groups I–III of the periodic system or a hydride of a metal belonging to Groups I–III of the periodic system; and (b) a combination product of titanium trichloride and a chloride of another transition metal selected from the group consisting of V, Mn, Co and Fe that is prepared by impregnating said carrier with a solution of a carbonyl of said other transition metal, refluxing the impregnated carrier with titanium tetrachloride to convert said carbonyl into the chloride of said other transition metal and then removing excess titanium tetrachloride.

4,151,111

PROCESS FOR PREPARING TITANIUM TRICHLORIDE COMPOSITIONS

Masuzo Yokoyama; Akira Yamada; Siyouzo Okosi; Tokuo Katou, and Shinichi Yoshida, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Apr. 15, 1977, Ser. No. 787,969
Claims priority, application Japan, Jun. 18, 1976, 51-71039
Int. Cl.[2] C08F 4/64
U.S. Cl. 252—429 B 19 Claims

1. A process for preparing a titanium trichloride composition comprising steps of:

reducing titanium tetrachloride with an organoaluminum compound to produce a titanium trichloride composition having a β-crystal structure; then

heat treating the resulting titanium trichloride composition having a β-crystal structure, and subsequently

pulverizing the heat-treated titanium trichloride to produce a titanium trichloride composition in the δ form containing substantially no titanium trichloride having a β-crystal structure; then

treating the pulverized titanium trichloride composition with an ether complexing agent for said titanium trichloride selected from the group consisting of diethyl ether, di-n-butyl ether, di-n-amyl ether, diisoamyl ether, di-n-hexyl ether, anisole, diphenyl ether, diethylene glycol dimethyl ether, and diethylene glycol mono-n-butyl ether; and

treating said titanium trichloride composition which has been treated with said complexing agent with an interhalogen compound.

4,151,112

TITANIUM TRICHLORIDE CATALYST COMPLEX AND PROCESS FOR THE PRODUCTION THEREOF

Harry J. Wristers, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 30, 1977, Ser. No. 811,507
Int. Cl.[2] C08F 4/64
U.S. Cl. 252—429 B 24 Claims

1. A process for producing a titanium trichloride catalyst complex having superior polymerization properties in the polymerization of alpha-olefins comprising:

(a) in a reduction step, contacting titanium tetrachloride with an organo metal compound of the formula R_nAlX_{3-n}, wherein R is a group having 1 to 18 carbon atoms selected from alkyl or aryl, X is a halogen and n is a numeral within the range of $1 \leqq n \leqq 3$ at about $-50°$ to about 100° C. in an inert diluent to obtain a reduced solids product;

(b) in an activation step, contacting the reduced solids of (a) with a chlorinated hydrocarbon and titanium tetrachloride in the presence of a Lewis base complexing agent, said chlorinated hydrocarbon, titanium tetrachloride and Lewis base complexing agent, respectively, being present in amounts of about 0.1 to about 10 mols·chlorinated hydrocarbon, about 0.1 to about 2.0 mols titanium tetrachloride and about 0.1 to about 2.0 mols Lewis base complexing agent per one mol of titanium trichloride in such reduced solids of (a), and said titanium tetrachloride being in a concentration of about 2 to about 15 volume percent at an elevated temperature within the range of from about 50° C. to about 150° C. for about 5 minutes to about 10 hours until a crystal conversion of the reduced solids product of (a) is obtained; and

(c) in a recovery step, recovering the resulting activated reduced solids product as said titanium trichloride catalyst complex in high yield.

4,151,113

HALOGENATED ORGANOALUMINUM COMPOUNDS AND METHOD OF PREPARATION

Warren A. Thaler, Matawan, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 635,695, Nov. 26, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,610
Int. Cl.[2] C08F 4/52
U.S. Cl. 252—429 R 25 Claims

1. An active catalyst composition which is hydrocarbon soluble consisting of a reaction product produced by mixing:

(1) material of the formula $RAlX_2$ wherein R is an alkyl radical of straight or branched chain structure of from 1 to 7 carbons and X is the same or different halogen selected from the group consisting of Cl, Br; and

(2) Y moles of halogen, or mixed halogen per mole of aluminum compound wherein the halogen is selected from the group consisting of Cl and Br such that (1-Y) ranges from less than 0.7 to about 0.2.

4,151,114
SILYLHYDROCARBYL PHOSPHINE TRANSITION METAL COMPLEXES

Alexis A. Oswald, Mountainside, and Lawrence L. Murrell, Elizabeth, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

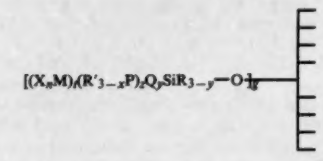
Continuation-in-part of Ser. No. 610,628, Sep. 5, 1975, Pat. No. 4,083,803, which is a continuation-in-part of Ser. No. 265,507, Jun. 23, 1972, Pat. No. 3,907,852. This application Sep. 1, 1977, Ser. No. 829,590

The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.

Int. Cl.[2] B01J *31/24*

U.S. Cl. 252—430 **6 Claims**

1. Anchored silylhydrocarbyl phosphines of the general formula:



wherein R′ is a C_{1-6} hydrocarbyl selected from the group consisting of saturated alkyl and aryl, R is selected from the group consisting of chloro, C_{1-4} acyloxy and C_{1-6} hydrocarbyl provided that at least one of the groups is not hydrocarbyl, Q is $(CH_2)_p$, p being 8 to 30, M is a transition metal of Groups VI to VIII, X is an anion or organic ligand, n is 2 to 6, x is 1 to 3, y and z are 1 or 2, g is 1 to 6, t is 0 to 3, wherein anchoring is through Si—O bonds to hydroxyl groups of inorganic solids selected from the group consisting of silica and metal oxides.

4,151,115
REFORMING WITH MULTIMETALLIC CATALYSTS

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 826,996, Aug. 23, 1977, abandoned. This application Dec. 19, 1977, Ser. No. 862,116

Int. Cl.[2] B01J *27/00, 27/02*; C10G *35/06*

U.S. Cl. 252—434 **8 Claims**

1. In a process for preparing a reforming catalyst wherein a Group VIII noble metal hydrogenation-dehydrogenation component in concentration ranging from about 0.01 to about 3 percent, based on the weight of the catalyst, an iridium component in concentration ranging from about 0.01 to about 3 percent, based on the weight of the catalyst, and a halogen component in concentration ranging from about 0.1 to about 3 percent, based on the weight of the catalyst, are composited with an inorganic oxide support, the improvement which comprises incorporating selenium within said catalyst at the time of its preparation in concentration ranging from about 0.001 to about 3 percent, based on the weight of the catalyst, sufficient to increase the activity, or selectivity, or both.

4,151,116
PREPARATION OF MALEIC ANHYDRIDE

Joseph X. McDermott, River Edge, N.J., assignor to Halcon Research and Development Corporation, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,290

Int. Cl.[2] B01J *27/14, 21/02*

U.S. Cl. 252—435 **9 Claims**

1. A catalyst effective for the oxidation of butane to produce maleic anhydride comprising a solid substrate containing phosphorus and vanadium, said substrate having a promoter component post-deposited upon its surface. Said post-deposited promoter component comprising an element selected from the group consisting of magnesium, calcium, scandium, yttrium, lanthanum, cerium, Uranium, chromium, manganese, iron, cobalt, nickel, copper, zinc, aluminum, gallium, indium, silicon, germanium, tin, antimony, bismuth and tellurium.

4,151,117
NOVEL OXIDATION CATALYST AND PRODUCTION OF UNSATURATED ALDEHYDES, ACIDS AND NITRILES THEREWITH

Francis W. Schlaefer, Pennsauken, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 178,507, Sep. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 149,343, Jun. 2, 1971, abandoned. This application Jul. 22, 1974, Ser. No. 490,449

Int. Cl.[2] B01J *27/18, 27/02*

U.S. Cl. 252—437 **9 Claims**

1. An oxidation catalyst system, having a metal oxide catalyst on a support, in calcined form, wherein the catalyst has the formula, on an atomic basis, $Sb_{0-1.1}Sn_{0-.1}Te_{.001-1}As_{0-1}A_{0-1}Y_{12}X_{2-12}Th_{.01-1}U_{0-2}Si_{O-50}P_{0-5}Ox$, werein A is Bi, Cd, or both, X is Fe, Co, or both, Y is Mo, W, or both, the symbol "Ox" indicating that oxygen is combined with elements recited in the formula.

4,151,118
PROCESS FOR SULFURIZATION OF HYDROGENATION CATALYSTS

Hisashi Akatsuka; Kiyoaki Naniwa, both of Tokyo; Nobukazu Iemura, Chita, and Kazufumi Ishida, Kawasaki, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,325

Claims priority, application Japan, Apr. 2, 1977, 52-36973

Int. Cl.[2] B01J *27/02*

U.S. Cl. 252—439 **7 Claims**

1. A process for activating a hydrogenation catalyst in a hydrogenation system having multiple reaction stages by sulfurization, which comprises sulfurizing the hydrogenation catalyst in each reaction stage thereof with a sulfur-containing hydrocarbon oil and a hydrogen-rich gas containing hydrogen sulfide in an amount of below 1,000 ppm (by volume) successively in the order of from the final reaction stage thereof to the first reaction stage thereof.

4,151,119
HYDROCARBON CONVERSION CATALYST

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 746,188, Nov. 30, 1976, which is a continuation-in-part of Ser. No. 626,225, Oct. 28, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 836,221

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **9 Claims**

1. A catalyst comprising: (1) from 3 to about 16 weight percent of a crystalline aluminosilicate zeolite, (2) from about 50 to about 85 weight percent of an inorganic oxide gel component, said inorganic oxide gel component comprising from about 83 to about 98 weight percent of silica, based on said inorganic oxide gel component, from about 1 to about 15 weight percent of zirconia, based on said inorganic oxide gel component and from about 0.2 to about 2 weight percent of alumina, based on said inorganic oxide gel component, and (3) from about 15 to about 40 weight percent of a porous adsorbent having a surface area greater than about 200 square meters per gram and having at least 0.2 cubic centimeter per gram of its pore volume in pores ranging in diameter from about 90 to about 200 Angstroms, said catalyst having at least 0.4 cubic centimeter per gram of its pore volume in pores of greater than 90 Angstroms in diameter.

3. The catalyst of claim 1 wherein said adsorbent is a substantially catalytically inert inorganic oxide.

4. The catalyst of claim 3 wherein said adsorbent is selected from the group consisting of silica, titania, magnesia, alumina and mixtures thereof.

4,151,120

PREPARATION PROCESS OF A CATALYST FOR CONVERTING AROMATIC HYDROCARBONS

Christian Marcilly, Houilles, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 14, 1977, Ser. No. 842,132

Claims priority, application France, Oct. 15, 1976, 76 31320; Dec. 22, 1976, 76 39015

Int. Cl.[2] B01J *29/06*; C07C *3/00*

U.S. Cl. 252—455 Z 11 Claims

1. In a process for the manufacture of a catalyst for hydrocarbon conversion, said catalyst consisting of a mordenite containing less than 0.5% by weight of sodium, wherein the molar ratio SiO_2/Al_2O_3 is in the range from 10 to 100, the mordenite further containing at least one metal selected from cobalt, nickel, silver and palladium, said process comprising eliminating the major portion of sodium from a mordenite in the sodium form; said mordenite having a molar ratio SiO_2/Al_2O_3 of about 10 incorporating said metal to said mordenite, and drying of the resulting catalyst mass at about 50° to 150° C., the improvement which comprises subjecting the resultant dried catalyst to a dry calcination between 300° and 700° C., in the presence of an inert or oxidizing dry gas containing less than 1% by volume of steam and then subjecting resultant calcined catalyst to a wet calcination between 250° and 700° C., in the presence of at least one gas selected from steam, an inert gas and an oxidizing gas, the inert or oxidizing gas containing by volume at least 3% of steam.

4,151,121

HYDROCARBON CONVERSION CATALYST CONTAINING A CO-OXIDATION PROMOTER

Elroy M. Gladrow, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 676,043, Apr. 12, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,512

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z 10 Claims

1. A hydrocarbon conversion catalyst which comprises particles of crystalline aluminosilicate zeolite and particles of a porous oxide support containing a CO oxidation promoter, which particles are each embedded in a porous oxide matrix to produce a catalyst composite thereof containing 2 to 20 wt. % of the zeolite and 2 to 100 ppm of a CO oxidation promoter comprising a metal or a compound of a metal selected from Periods 5 and 6 of Group VIII of the Periodic Table, rhenium, chromium, manganese and combinations thereof.

2. The catalyst of claim 1 wherein said CO oxidation promoter is selected from the group consisting of platinum, palladium, rhodium, rhenium, iridium, and combinations thereof.

3. The catalyst of claim 2 wherein said matrix is selected from the group consisting of silica, alumina, magnesium, zirconia, kaolin and montmorillonite, clays and combinations thereof.

4,151,122

REDUCTION AND REOXIDATION OF COGEL OR SELF-REDUCED CATALYST

Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1977, Ser. No. 857,553

Int. Cl.[2] B01J *29/00, 37/02*

U.S. Cl. 252—458 31 Claims

1. A process for activating a chromium-containing catalyst prepared by coprecipitating a titanium compound and silica to form a cogel comprising a first step wherein said catalyst is contacted with a nonoxidizing ambient at a temperature of at least 600° C. and a subsequent second step where it is contacted with an oxygen-containing oxidizing ambient at a temperature within the range of 450°–1000° C.

16. A process for producing a catalyst active for olefin polymerization comprising subjecting a titanium-free silica composition containing chromium wherein at least a portion of said chromium is in the form of CrO_3 to an inert ambient for a time and at a temperature sufficient to self-reduce at least a portion of said CrO_3 to a lower valence state, and thereafter subjecting the thus self-reduced composition to a reducing ambient at a temperature sufficient to further reduce at least a portion of said chromium, and thereafter reoxidizing the thus reduced composition.

4,151,123

CATALYTIC PEROVSKITES ON PEROVSKITE SUPPORTS AND PROCESS FOR PREPARING THEM

Elrey L. McCann, III, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 566,109, Apr. 8, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,747

Int. Cl.[2] B01J *21/04, 23/10, 23/58, 23/78*

U.S. Cl. 252—462 17 Claims

1. A catalytic composition comprising a catalytically effective amount of at least one first metal oxide on a support of a second meta' oxide, each of the first and second metal oxides having a perovskite crystal structure and the general formula, ABO_3,

the first metal oxide having A site cations comprising at least one metal selected from Group 2A, lanthanum and the lanthanide rare earth metals, and having B site cations comprising at least one metal having an atomic number of 23 to 30, 42 to 47, or 74 to 79,

the second metal oxide containing substantially equal numbers of metal cations in the A and the B sites, the A site cations being cations of at least one metal from Groups 1A, 1B, 2A, 3B, 4A, 5A, and the lanthanide rare earth metals, the B site cations being cations of at least one metal from Groups 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, 6B, 7B, 8 and the lanthanide rare earth metals.

4,151,124

SORBENT COMPOSITION AND PROCESS FOR PREPARING IT

Dimitri Gidaspow, Chicago, Ill.; Hossein Hariri, Sale, England, and Hamid Arastoopour, Chicago, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Dec. 16, 1977, Ser. No. 861,254

Int. Cl.[2] B01J *23/78*

U.S. Cl. 252—474 7 Claims

1. A thermally regenerable sorbent composition for removal of oxides of nitrogen from a gas stream, said sorbent consisting essentially of iron, cobalt and sodium oxides wherein the proportions based upon the metals present are about 15 to 35 wt. percent Fe, about 15 to 35 wt. percent Co and greater than about 5 wt. percent Na.

4,151,125

BIOCIDAL ADDITIVE FOR CUTTING FLUIDS

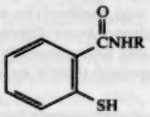
Jorge P. Li, Libertyville, and John W. Williams, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 719,039, Aug. 30, 1976, abandoned. This application May 31, 1977, Ser. No. 801,892

Int. Cl.[2] C10M *3/32*; C07C *103/28*; A01N *9/12, 9/20*

U.S. Cl. 252—47.5 2 Claims

1. A stable liquid composition for dissolution in metal working fluids to protect such fluids against industrial micro-organisms containing between 5 and 50% by weight of a mercapto compound of the formula



wherein R=H or alkyl containing 1–8 carbon atoms in a mixture of dimethylacetamide with dicyclohexylthiourea in a ratio of 4.5–5.5:1 containing 3.5 to 4.5 parts of the adduct between ethylene oxide and t-octyl- or t-nonylphenol containing 5–15 ethylene oxide groups per molecule.

2. The composition of claim 1 wherein R is alkyl.

4,151,126

POLYOLEFIN/CONDUCTIVE CARBON COMPOSITES

Robert L. Adelman, Wilmington, and Edward G. Howard, Jr., Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1977, Ser. No. 790,857

Int. Cl.² C08K *3.04, 9/10*

U.S. Cl. 252—508 **7 Claims**

1. A solid, halogen-free, homogeneous, particulate, polyolefin/conductive carbon composite which comprises by weight

(a) 15 to 60% of ultra high molecular weight polyolefin selected from the group consisting of polyethylene and copolymers of ethylene containing up to 15% by weight of units derived from one or more 1-alkenes of 3 to 10 carbons, and

(b) 40 to 85% of finely-divided filler, said filler comprising by weight, based on the total composite,

(1) 15 to 75% of conductive carbon having a weight-average equivalent spherical particle diameter of 5 to 500 millimicrons, and

(2) 10 to 70% of inorganic filler compound having a neutral-to-acidic surface and a weight-average equivalent spherical particle diameter, of 0.1 to 50μ,

in which essentially all of the polyolefin is polymerized onto the surface of the filler, and essentially all of the filler has polyolefin polymerized onto its surface, and the composite has a resistivity of not more than 5 ohm cm in compression molded form.

4,151,127

PROCESS FOR SUPPRESSING THE FOAMING OF DETERGENTS

Johannes Perner, Neustadt; Guenter Frey, Boehl-Iggelheim; Herbert Helfert, Frankenthal, and Rolf Fikentscher, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

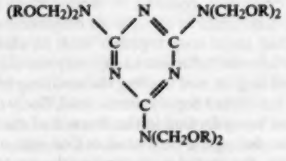
Filed Mar. 3, 1978, Ser. No. 883,217

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710355

Int. Cl.² C11D *7/32, 3/38;* **B01D** *17/00*

U.S. Cl. 252—542 **2 Claims**

1. A process for reducing the foaming of a detergent or rinse by adding an anti-foam agent, wherein from 0.1 to 3% by weight, based on the detergent or rinse, of one or more compounds of the formula I



where from 25 to 100% of all radicals R are alkyl of 7 to 22 carbon atoms or acyl derived from an alkanecarboxylic acid or alkenecarboxylic acid of 7 to 22 carbon atoms and the remaining radicals R (if any) are alkyl of 1 to 4 carbon atoms, is employed as the anti-foam agent.

4,151,128

GRAFT COPOLYMERS BY SUSPENSION PROCESS FOLLOWING EMULSION

Alfred J. Ackerman, Mentor, Ohio, and Frederick E. Carrock, Paramus, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 399,282, Sep. 18, 1973, abandoned, which is a continuation of Ser. No. 748,656, Jul. 30, 1968, abandoned. This application Apr. 27, 1976, Ser. No. 680,654

Int. Cl.² C08L *1/26, 9/00*

U.S. Cl. 260—17 A **10 Claims**

5. A process for preparing a rubber based graft acrylonitrile-butadiene-styrene polymer with superior impact strength comprising:

(a) subjecting a stable, water-based emulsion type polybutadiene latex having a particle size range between about 0.005 and 1 micron to emulsion state graft polymerization in the absence of suspending agents with at least 5% and up to an equal amount by weight based upon said polybutadiene of a mixture of styrene/acrylonitrile monomers in a weight ratio of between about 80/20 and about 60/40 in the presence of polymerization catalysts of the emulsion polymerization type and sufficient emulsifying agents to maintain the stable emulsion state,

(b) combining the emulsion grafted latex thus produced in step (a) with sufficient suspending agent to convert same to the discrete suspension state,

(c) introducing into the suspension thus formed in step (b) additional styrene/acrylonitrile monomers in a weight ratio between about 80/20 and 60/40 as well as an organic peroxide initiator of the type effective for catalyzing suspension state graft polymerization of said monomers,

(d) effecting suspension state graft polymerization of the additional monomers introduced in step (c) until a final graft copolymer is formed containing by weight a total of between 70 and 97% of said styrene/acrylonitrile constituents, and

(e) recovering said final graft copolymer directly from step (d) in the form of beads.

10. The process of claim 5 wherein hydroxyethylcellulose is used as the suspending agent in step (b).

4,151,129

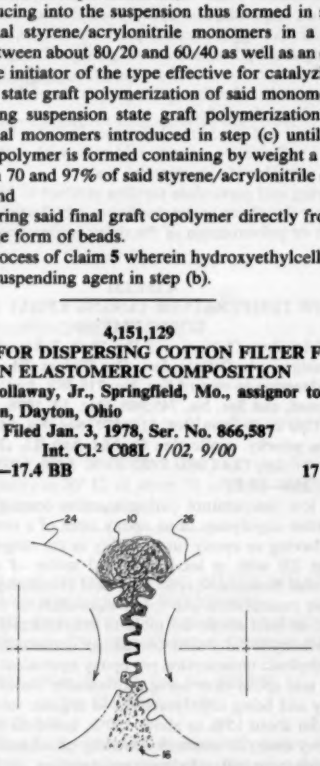
METHOD FOR DISPERSING COTTON FILTER FLY IN AN ELASTOMERIC COMPOSITION

Gerald C. Hollaway, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 3, 1978, Ser. No. 866,587

Int. Cl.² C08L *1/02, 9/00*

U.S. Cl. 260—17.4 BB **17 Claims**



1. A method for rendering cotton filter fly dispersible in an elastomeric composition which comprises the steps of applying

point contact compressive force to said filter fly and thereafter recovering the resulting dispersible product.

9. A method for producing an elastomeric composition having cotton filter fly dispersed therethrough which comprises passing cotton filter fly between means for applying point contact compressive force to said filter fly, recovering the resulting dispersible product, intimately mixing from 0.5 to about 40 parts of said dispersible product with 100 parts of an elastomer and thereafter recovering the resulting elastomeric composition having said filter fly dispersed therethrough.

4,151,130
POLYMER MODIFIED CELLULOSE FIBERS AND METHOD OF PRODUCING

James W. Adams, Schofield, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 2, 1978, Ser. No. 874,667
Int. Cl.[2] C08L *1/08*
U.S. Cl. 260—17.4 GC **13 Claims**

1. In a process for modifying cellulosic material to produce absorbent and structural integrity characteristics therein, said process comprising treating an aqueous slurry of said cellulosic material fibers with an ethylenically unsaturated compound containing at least one functional moiety selected from the group consisting of acrylamido, acyl halide, nitrile, ester, alkenyl halide, carboxylate and carboxyl to effect polymerization onto said cellulosic material, the improvement which comprises:

a. hydrolyzing or neutralizing said modified cellulosic material fibers at a total solids concentration of between about 35 to about 60% to form a graft copolymer of cellulosic fibers and an alkali metal salt of said ethylenically unsaturated compound, said hydrolyzed product being a porous, crumb-like agglomerated, particulate mass;

b. aging said hydrolyzed crumb product for a period of time sufficient to increase the absorptive properties thereof as compared to the absorptive properties of the fresh hydrolyzed crumb product;

c. soaking said aged crumb product in water for a period of time sufficient to saturate said mass with water and swell the particles of said material; and

d. drying said particulate swollen product to remove excess water therefrom under conditions which avoid fragmentation or pulverization of the dried agglomerated product.

4,151,131
LOW TEMPERATURE CURING EPOXY ESTER COPOLYMERS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 715,382, Aug. 18, 1976, abandoned, and Ser. No. 749,968, Dec. 13, 1976, abandoned.
This application Oct. 21, 1977, Ser. No. 844,021
Claims priority, application Canada, Aug. 12, 1977, 284607
Int. Cl.[2] C09D *3/52, 3/56, 3/58, 5/02*
U.S. Cl. 260—19 EP **21 Claims**

1. A low temperature curing aqueous coating comprising epoxy ester copolymer of an epoxy ester of a resinous polyepoxide having an epoxy functionality in the range of from 1.4 to about 2.0 with at least about 0.2 moles of ethylenically unsaturated monocarboxylic fatty acid containing conjugated ethylenic unsaturation per epoxy equivalent in the polyepoxide, and at least about 0.5 mole of ethylenically unsaturated monocarboxylic fatty acid containing nonterminal nonconjugated ethylenic unsaturation per epoxy equivalent in the polyepoxide, said epoxy ester being substantially free of epoxy functionality and being copolymerized in organic solvent solution with from about 15% to about 150%, based on the weight of the epoxy ester, of monoethylenically unsaturated monomers containing terminal ethylenic unsaturation to form a nongelled, solvent-soluble, copolymer possessing residual ethylenic unsaturation adapting the same for an oxidative cure, said monomers including from about 3% to about 20%, based on the weight of the copolymer, of carboxyl-functional monomers selected from acrylic acid, methacrylic acid, fumaric acid and maleic acid, said copolymer being dispersed in water with the aid of a volatile base and water miscible organic solvent, said water also having dispersed therein an aminoplast or phenoplast resin.

4,151,132
MOLDING COMPOSITION

Sarwan K. Khanna, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,716
Int. Cl.[2] C08L *91/00*; G11B *11/12*
U.S. Cl. 260—23 XA **10 Claims**

1. A molding composition for molding conductive articles, said composition having a bulk resistivity below about 500 ohm-cm at 900 megahertz comprising from about 12 to about 20 percent by weight of finely divided conductive carbon black particles; about 10 percent by weight of a vinyl chloride copolymer containing about 15 percent by weight of vinyl acetate; about 10 percent by weight of a vinyl chloride copolymer containing about 25 percent by weight of maleate ester; about 15 to 17 percent by weight of a mixture of 4 or more plasticizers and processing aids; about 3.5 percent by weight of a mixture of 2 or more metal stabilizers together containing more than one metal ion; about 1.5 percent by weight of a mixture of at least three lubricants and the remainder a copolymer of vinyl chloride containing about 6–8 percent by weight of propylene, the above ingredients being uniformly dispersed in said molding composition.

4,151,133
POLYMER DISPERSION PROCESS

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,873
The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.
Int. Cl.[2] C08K *3/24, 9/05*
U.S. Cl. 260—23 H **10 Claims**

1. A process for dispersing an olefin polymer containing from about 15% up to about 35% polar comonomer which comprises agitating said polymer in molten state in an aqueous dispersion system comprising an alkali metal soap together with a water-soluble substantially neutral salt inert to said soap and cooling said system with the polymer in the disperse state to below about 100° C.

4,151,134
PROCESS FOR SIMULTANEOUSLY DISPERSING AND SAPONIFYING ETHYLENE-VINYL ACETATE COPOLYMER

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,934
Int. Cl.[2] C08K *3/24*; C08K *9/05*
U.S. Cl. 260—23 H **7 Claims**

1. A process for simultaneously dispersing and saponifying ethylene-vinyl acetate copolymer to provide saponified copolymer of desired degree of saponification in finely-divided form which comprises agitating in molten state an ethylene-vinyl acetate copolymer in an aqueous dispersion system comprising an alkali metal soap together with an alkali metal hydroxide in an amount sufficient to saponify the copolymer to a predetermined degree; and cooling the resulting hot dispersion to obtain the saponified copolymer in solid, finely divided form said dispersion being formed in the absence of discharge of the hot dispersion through a restricted orifice into a zone of reduced pressure, the particles comprising the cooled dispersion having a number average diameter ranging from about 20 microns up to about 500 microns, with the majority of particles being less than 250 microns.

4,151,135

PROCESSES FOR PRODUCING DRY POWDERS FROM TACKY POLYMERS VIA DISPERSION OF SAME IN WATER WITH DISPERSANTS CONVERTIBLE TO PARTING AGENTS

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,935
Int. Cl.[2] C08F 6/14, 18/08; C08J 3/18, 3/20
U.S. Cl. 260—23 R 31 Claims

1. A process for improving the parting characteristics of particulate ethylene-vinyl acetate polymers comprising from about 25% to about 85% vinyl acetate units and corresponding hydrolyzed ethylene-vinyl acetate polymers which comprises agitating in molten state said polymer in an aqueous dispersion system comprising an alkali metal soap and cooling the resulting dispersion to obtain said polymer as finely divided particles; and converting said soap in situ to the carboxylic acid corresponding thereto or to the corresponding alkaline earth metal soap to coat said particles.

4,151,136

ACID REACTABLE INORGANIC MINERAL FILLERS HAVING IMPROVED COMPATIBILITY WITH POLYOLEFIN RESINS

Stephen W. Cornell, Naperville, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,102
Int. Cl.[2] C08J 5/06; C08K 9/04
U.S. Cl. 260—23 H 6 Claims

1. A food container formed from a polyolefin having intimately incorporated therein a coated filler prepared by the sequential steps of reacting an inorganic, acid reactable mineral filler with a long chain carboxylic acid having 8 to 22 carbon atoms to form an acid reacted filler surface,

contacting the acid reacted filler with a vinyl ester of a long chain carboxylic acid having 8 to 22 carbon atoms and then

polymerizing the vinyl ester to encapsulate the acid reacted filler with a polymerized coating of the vinyl ester.

4,151,137

BLEND COMPOSITIONS

Ilan Duvdevani, Fort Lee, N.J., and Jan Bock, Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,728
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—23.5 A 23 Claims

1. An elastomeric composition having a viscosity at 0.73 sec^{-1} at 200° C. of less than about 8×10^5 poises, said composition injection moldable or extrudable into an elastomeric article, which comprises:

(a) a neutralized sulfonated elastomeric polymer having about 5 to about 50 meq. neutralized sulfonate groups per 100 grams of said sulfonated elastomeric polymer;

(b) about 20 to about 200 parts by weight of a non-polar process oil per hundred parts of said neutralized sulfonated elastomeric polymer, said oil having less than about 2 wt. % polar constituents;

(c) about 25 to about 200 parts by weight of an amorphous silica filler per hundred parts of said neutralized sulfonated elastomeric polymer, said amorphous silica filler having a particle size of less than about 2 microns treated or untreated, wherein a ratio of said amorphous silica filler to said oil is from about 0.2 to about 4; and

(d) a preferential ionic plasticizer at about at least 5 parts per hundred parts of said neutralized sulfonated elastomeric polymer.

4,151,138

COATING COMPOSITIONS

Anthony M. Citrone, Chinnor, and Richard W. Avery, High Wycombe, both of England, assignors to Reckitt & Colman Products Ltd., London, England

Filed Mar. 8, 1977, Ser. No. 775,666
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—28.5 AV 2 Claims

1. A solid composition for addition, with sufficient alkaline reacting compound, to an aqueous medium to afford a uniform aqueous dispersion of pH greater than 7, said composition obtained from spray drying the following composition:

alakli dispersion polyethlene wax emulsion;

at least one surfactant; and

acrylic copolymer emulsion, containing 3.8% to 29.5% by weight of monomer of monocarboxylic acid expressed as acrylic acid.

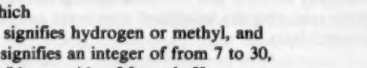
4,151,139

WATER SOLUBLE POLYGLYCOL DIEPOXIDE-POLYAMINE AMIDE REACTION PRODUCTS AS ANTISTATIC AGENTS

Richard Hochreuter, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 693,019, Jun. 4, 1976, abandoned, which is a continuation of Ser. No. 508,556, Sep. 23, 1974, abandoned, which is a continuation of Ser. No. 282,610, Aug. 21, 1972, abandoned. This application Feb. 27, 1978, Ser. No. 881,825
Claims priority, application Switzerland, Aug. 25, 1971, 12501/71
Int. Cl.[2] C08G 59/04, 59/44
U.S. Cl. 260—29.2 EP 19 Claims

1. A water soluble polyaddition reaction product of (a) a polyglycol diepoxide of formula I,



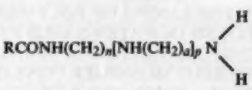
I

in which

R' signifies hydrogen or methyl, and

m signifies an integer of from 7 to 30,

with (b) an amide of formula II,



II

in which

R signifies an alkyl radical of 1 to 21 carbon atoms,

p signifies 1, 2, 3 or 4, and

n and a are the same or different, and each signifies 2 or 3, having a viscosity at 20° C. of about 50 to about 20,000 cp, or a derivative thereof with acid.

4,151,140

PROCESS FOR HYDROLYZING WATER-SOLUBLE CARBOXAMIDE POLYMERS

Henry Volk, Bay City, and Jack C. Lamphere, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1977, Ser. No. 847,878
Int. Cl.[2] C08L 33/24
U.S. Cl. 260—29.6 H 5 Claims

1. In a method for hydrolyzing an inherently water-dispersible carboxamide polymer having a plurality of carboxamide groups dispersed in the aqueous phase of a water-in-oil emulsion wherein the emulsion is contacted with a hydrolyzing agent, said carboxamide polymer being a polymer containing

at least 50 mole percent of polymers having substituent carboxamide groups represented by the formula:

wherein each R is individually hydrogen, alkyl, aminoalkyl, hydroxyalkyl or $-R'-N^{+}(R'')_3X^{\ominus}$ wherein R' is alkylene, each R'' is individually alkyl or hydroxyalkyl and $X^{\ominus}$ is a neutralizing anion, the improvement which comprises contacting the water-in-oil emulsion of the polymer with a water-in-oil emulsion of the hydrolyzing agent whereby the desired portion of carboxamide groups are hydrolyzed to carboxy groups without significantly destabilizing the water-in-oil emulsion of the polymer.

4,151,141

PROCESS FOR CONTINUOUSLY REMOVING VOLATILE ORGANIC MATERIAL FROM AQUEOUS DISPERSIONS OF SYNTHETIC POLYMERS

Eugene R. Moore; Thomas K. Christianson, and Ronald L. Wence, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1977, Ser. No. 851,910
Int. Cl.[2] C08L *27/06*
U.S. Cl. 260—29.6 R **4 Claims**

1. A process for continuously removing residual monomer having a boiling point lower than or equal to that of water from a shear-sensitive synthetic polymer latex obtained from an emulsion polymerization reaction, which process consists essentially of flowing a stream of the latex once into a zone having a vapor space above the liquid level of the stream without subjecting the latex to shearing forces which cause coagulation of the polymer or to temperatures which cause degradation of the polymer, wherein the pressure within the zone is maintained at about the vapor pressure of water at the temperature of the stream and wherein the stream as it enters the zone is maintained at a depth sufficiently shallow to promote substantially uniform and complete boiling throughout, and thereafter removing the volatilized monomers and recovering the treated latex.

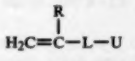
4,151,142

WET ADHESION EMULSIONS OF POLYMER RESINS SYSTEMS EMPLOYED IN WATER-BASED PAINT AND COATING COMPOSITIONS COMPRISING AS A COMPONENT THEREOF MONOMER CONTAINING AN ETHYLENIC DOUBLE BOND AND A UREIDO GROUP POLYMERIZED THEREIN

Frederick L. Herman, Allentown, and Dale D. Dixon, Kutztown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 709,677, Jul. 29, 1976, Pat. No. 4,111,877. This application Jan. 31, 1978, Ser. No. 873,813
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C08L *35/00*
U.S. Cl. 260—29.6 R **19 Claims**

1. Aqueous emulsions of polymer resin systems employed in water-based paint and coating compositions, comprising as a component thereof conferring enhanced wet adhesion properties, a reactable monomer corresponding to the structural formula



(I)

wherein R is hydrogen or methyl, U designates a cyclic or acylic ureido or thioureido group and L designates CH_2 or a linking chain containing in said chain at least one moiety from the group consisting of oxygen, amido, amino, and carbonyl, provided that any carbonyl group present is not directly attached to U or to an ethylenic carbon atom nor is an ethylenic carbon directly attached to a nitrogen atom, said reactable monomer being polymerized into said polymer resin system.

4,151,143

SURFACTANT-FREE POLYMER EMULSION COATING COMPOSITION AND METHOD FOR PREPARING SAME

Werner J. Blank, Wilton, and Ralph E. Layman, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 19, 1977, Ser. No. 826,207
Int. Cl.[2] C08L *33/02*
U.S. Cl. 260—29.6 RW **10 Claims**

1. A two-stage method for preparing a surfactant-free polymer emulsion product which comprises, in a first stage, (1) forming a mixture of polymerizable monomers comprising, by weight from about 3 to about 15% of a carboxylic acid or anhydride selected from the group consisting of acrylic, methacrylic and maleic acid and their anhydrides and the C_1–C_8 alkyl half esters of maleic acid, from about 30 to about 97% of a C_1–C_8 alkyl acrylate or C_1–C_8 alkyl methacrylate, from 0 to about 25% of a C_2–C_4 hydroxy alkyl ester of a carboxylic acid or acrylamide or methacrylamide and from 0 to about 35% styrene, (2) polymerizing said mixture in the presence of a polymerization catalyst, a suitable solvent, and optionally a molecular weight regulator to form a polymer having an average molecular weight of from about 3000 to about 50,000, (3) neutralizing the polymer with an amine or base to the extent required to make the polymer water-dispersible and (4) forming a dispersion of the polymer in water, and, in a second stage, (5) forming a second mixture of polymerizable monomers comprising, by weight, from about 40 to about 100% of a C_1–C_8 alkyl acrylate or C_1–C_8 alkyl methacrylate, from about 0 to about 25% of a C_2–C_4 hydroxyalkyl ester of a carboxylic acid or acrylamide or methacrylamide and from about 0 to about 35% of styrene, (6) combining said second monomer mixture and a polymerization catalyst with the dispersion produced in step (4), the proportion of the second stage monomer mixture combined being such as to comprise from about 20 to about 80% of the total weight of the first and second stage monomer mixtures, and (7) heating the mixture so formed to effect polymerization and produce the polymer emulsion product.

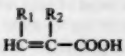
4,151,144

GLOSS EMULSION PAINT CONTAINING A BINDER LATEX AND TWO COPOLYMERS WHICH ARE SALTS OR COPOLYMERS OF UNSATURATED MONOCARBOXYLIC ACID AND AN UNSATURATED ESTER

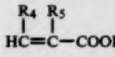
Allen F. Dyson, Bradford, and David Marshall, Mirfield, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed Nov. 18, 1977, Ser. No. 852,773
Int. Cl.[2] C08L *33/02*
U.S. Cl. 260—29.6 WB **8 Claims**

1. A gloss emulsion paint comprising a pigment dispersion intimately mixed with a binder latex and including stabilisers for stabilising the dispersion and the latex, and which additionally includes first and second gloss improving, film forming, copolymers each of which is an alkali metal, ammonium, or organic amine salt of a copolymer of an unsaturated monocarboxylic acid of the formula:



with an unsaturated acid ester of the formula:



in which R_1, R_2, R_4 and R_5 may be the same or different and are hydrogen or methyl and R_3 is an alkyl group containing 1 to 4 carbon atoms and in which the first copolymer has an average molecular weight between 10,000 and 20,000 and contains 5 to 20 mole percent of the unsaturated acid units and 95 to 80% of the ester units and the second copolymer contains 5 to 40 mole percent of the acid groups and 60 to 95 mole percent of the ester groups, and has an average molecular weight of 50,000 to 150,000, the percentages being based on acid plus ester.

4,151,145

LATEX-MODIFIED, PRETENSIONED AND PRESTRESSED STRUCTURES HAVING ENHANCED STRUCTURAL LOAD BEARING CAPACITY

Gale L. Emig, and Daniel Moldovan, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1977, Ser. No. 853,950
Int. Cl.[2] C08K *3/00*
U.S. Cl. 260—29.6 S **8 Claims**

1. A latex-modified, pretensioned, and prestressed concrete structure, having at least about a 50% reduction in bond transfer length as compared to a structure not modified by a latex, composed of a cured concrete composition comprising a mixture of (1) portland cement, (2) mineral aggregate, and (3) a vinylidene chloride polymer latex, said latex being present in an amount sufficient to provide from about 5 to about 25 percent by weight of polymer solids and wherein said vinylidene chloride is an organic interpolymer composed of from about 35 to about 90 parts by weight of vinylidene chloride and from about 65 to about 10 parts by weight of at least one other interpolymerized material of the general formula:

wherein "R" is selected from the group consisting of hydrogen and the methyl group and "X" is selected from the group consisting of —CN, halogens of atomic numbers 9 to 35, and ester-forming groups, —COOY, wherein "Y" is selected from the group consisting of a primary alkyl group and a secondary alkyl group, each of the foregoing alkyl groups containing from 1 to 18 carbon atoms inclusively.

4,151,146

PROCESS FOR PREPARING MULTIFUNCTIONAL ACRYLATE-MODIFIED VINYL ESTER-ALKYL ACRYLATE/METHACRYLATE COPOLYMER COAGULUM-FREE LATEX

Ralph F. Patella, South Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,363
Int. Cl.[2] C08F *218/04, 218/08*
U.S. Cl. 260—29.6 T **16 Claims**

1. A process for preparing multifunctional acrylate modified-vinyl ester-alkyl acrylate/methacrylate copolymer latex, highly stable and substantially coagulum-free, which comprises emulsion-polymerizing a non-pre-emulisified mixture of:

(i) from about 40% to about 95%, based on the total weight of comonomers, of a vinyl ester selected from the group consisting of vinyl acetate, vinyl propionate and vinyl butyrate

(ii) from about 5% to about 35%, based on the total weight of comonomers, of an ester derived from the reaction of a monohydric alcohol and acrylic acid or methacrylic acid, and

(iii) from about 0.5% to about 10%, based on the total weight of comonomers, of an ester derived from the reaction of a polyhydric alcohol and an acid selected from the group consisting of acrylic acid and methacrylic acid, there being at least two hydroxyl groups of the alcohol esterified with the acid,

in the presence of water, a free radical polymerization catalyst and a normally liquid mercaptan chain transfer agent.

4,151,147

PROCESS FOR PREPARING ALL-ACRYLIC COPOLYMER LATEX

Chris F. Neuschwanter, Hudson, and Eli Levine, Union, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,677
Int. Cl.[2] C08L *33/08*
U.S. Cl. 260—29.6 T **8 Claims**

1. In a process for preparing a copolymer latex in which two or more comonomers of alkyl acrylates or alkyl methacrylates wherein the alkyl group contains from 1 to 8 carbon atoms, are polymerized in the presence of a catalytic amount of a substantially water soluble free radical polymerization catalyst for a period sufficient to provide a copolymer, the improvement which comprises polymerizing said alkyl acrylates or alkyl methacrylates in the presence of a polymerization promoting amount of a multifunctional acrylate which is an acrylic or methacrylic acid ester of a polyol in which at least two hydroxyl groups are esterified.

4,151,148

CATIONIC, CROSS-LINKABLE ACRYLIC-POLYESTER RESIN BINDER SYSTEMS

David G. Chasin, and Joseph Feltzin, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 546,344, Feb. 3, 1975, Pat. No. 4,012,353.
This application Oct. 20, 1976, Ser. No. 735,417
Int. Cl.[2] C08L *67/06*; C08F *299/04*
U.S. Cl. 260—29.6 RB **5 Claims**

1. A cross-linkable polyester resin composition comprising a cross-linkable copolymer resin prepared from a monomer system which comprises:

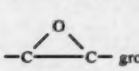
(a) 30–80 percent by weight of a non-functional alpha,beta-ethylenically unsaturated main monomer selected from the group consisting of styrene, alkyl styrene, lower alkyl acrylates, methacrylates, vinyl ethers, vinyl acetates and substituted vinyl derivatives;

(b) 0.1 to 15 percent by weight of an alpha,beta-ethylenically unsaturated monomer containing carboxyl groups;

(c) up to 15 percent by weight acrylamide and N-alkyl substituted acrylamides;

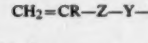
(d) 1 to 15 percent by weight of an N-alkoxyalkylamido group containing alpha,beta-ethylenically unsaturated monomer; and

(e) up to 12 percent by weight of a cross-linkable epoxy resin modifier having reactive



and

(f) 1–15 percent by weight of an alpha,beta-ethylenically unsaturated monomer having the following general formula:



wherein

R is H or $—CH_3$;

Z is $—CO_2—CONH—$;

Y is an alkylene radical having 2–4 carbon atoms;

R′ is a monovalent alkyl group the three of which may be the same or different; and

X is an anion;

said alkyl group in said above described compounds being hydrocarbon radicals having 1–4 carbon atoms, and said cross-linkable polyester is a polyesterification product of an unsaturated dicarboxylic acid and a polyhydric alcohol and which is substantially cross-linked with said copolymer.

4,151,149

VINYLIDENE CHLORIDE POLYMER LATICES

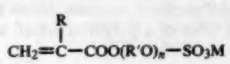
David R. Smith, Decatur, Ill., assignor to Union Oil Company of California, Brea, Calif.

Filed Sep. 27, 1976, Ser. No. 727,208
Int. Cl.[2] C08L 27/08
U.S. Cl. 260—29.6 SQ **21 Claims**

1. A vinylidene halide copolymer latex comprising an internal phase of vinylidene halide copolymer particles homogeneously dispersed within an external aqueous phase, said vinylidene halide copolymer particles comprising the copolymerizate of:

(A) vinylidene halide as the principal copolymerized comonomer;

(B) from about 0.2 to about 5 percent by weight of an ethylenically unsaturated sulfated monomer represented by the structural formula:



wherein R is at least one member selected from the group consisting of hydrogen and hydrocarbyl, R′ represents a hydrocarbylene group, n is an integer having a value of at least one, and M is a cation;

(C) from about 0.5% to 25% by weight of a hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid; and

(D) up to 40 percent by weight of an ethylenically unsaturated monomer other than copolymerized comonomers (A), (B) and (C).

4,151,150

STYRENE-BUTADIENE INTERPOLYMER LATEX BASED CEMENT ADDITIVES CONTAINING A SILANE

James Peters, and Victor E. Meyer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1977, Ser. No. 865,068
Int. Cl.[2] C08L 9/08
U.S. Cl. 260—29.7 R **16 Claims**

1. A cement additive comprising (1) a styrene-butadiene interpolymeric latex containing up to about 60 parts by weight of interpolymer solids, (2) as a coupling agent from about 0.05 to about 3 parts by weight of latex solids of a silane of the formula $ZSi(OR')_3$ wherein Z is a member selected from the group consisting of hydrocarbon groups and substituted hydrocarbon groups in which the substituent is bonded to the silicon atom through at least one carbon atom, and R′ is selected from the group consisting of alkyl radicals of from 1 to 3 carbon atoms, $—CH_2CH_2OR''$ and $—CH_2CHOH$ where R″ is an aliphatic hydrocarbon radical of 1 to 3 inclusive carbon atoms.

4,151,151

FLOW IMPROVERS FOR HIGH NITRILE COPOLYMERS

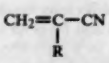
Ralph Isley, Northfield, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 16, 1978, Ser. No. 870,053
Int. Cl.[2] C08K 5/09
U.S. Cl. 260—30.4 N **11 Claims**

1. The composition which comprises an intimate mixture of 100 parts by weight of

(1) a polymer prepared by the polymerization in an aqueous medium of 100 parts by weight of

(A) from 60 to 90% by weight of at least one nitrile having the structure

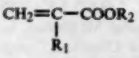


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 40% by weight based on the combined weight of (A) plus (B) of at least one member selected from the group consisting of

(1) styrene,

(2) an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(3) an alpha-olefin having the structure

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

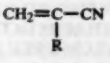
(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(5) vinyl acetate, and

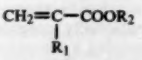
(6) indene,

in the presence of from 0 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure



wherein R has the foregoing designation, and an ester having the structure



wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer,

and from about 5 to 20 parts by weight of

(II) a polar organic material selected from the group consisting of glutaric anhydride, phthalimide, saccharin, adipamide, salicyl amide, and succinimide.

4,151,152

STABLE FAST-SETTING VARNISHES BASED ON POLYESTERS AND BLOCKED ALIPHATIC DIISOCYANATE

Karl Schmitt; Josef Disteldorf, both of Herne, and Flexi Schmitt, Herten-Langenbochum, all of Fed. Rep. of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Fed. Rep. of Germany

Continuation of Ser. No. 648,591, Jan. 12, 1976, which is a continuation of Ser. No. 506,931, Sep. 17, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,453

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1973, 2346818

Int. Cl.² C08G 18/42; C08K 5/10; C08G 18/80

U.S. Cl. 260—33.6 UB 2 Claims

1. A liquid varnish consisting essentially of

(I) a high boiling varnish solvent; and

(II) a binder consisting essentially of a mixture of

A. 50–90% by weight of a hydroxyl group containing polyester having a hydroxyl number between 50 and 150 mgs/KOHg, said hydroxyl group containing polyester prepared by reacting an aromatic dicarboxylic acid, ester or anhydride with a diol and/or triol having 4–12 carbon atoms, the molar ratio of aromatic hydroxyl containing polyester to any polyester having aliphatic or cycloaliphatic dicarboxylic acid residues being greater than 4:1, and

B. 10–50% by weight of an adduct of 2-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate blocked with epsilon-caprolactam,

wherein

(a) the hydroxy containing polyester is prepared by condensation of a reaction mixture consisting essentially of terephthalic acid dimethyl ester, a mixture of 2,2,4- and 2,4,4-trimethylolhexanediol-1,6 and 1,1,1-trimethylolpropane, the resultant polyester having a molecular weight of 1600 to 1700;

(b) the solvent comprises ethylglycol acetate and a mixture of aromatic hydrocarbons boiling in a range of 180°–212° C. and having a flame point of at least 65° C.; and

(c) the liquid varnish remaining clear when stored at room temperature for a period of at least one month.

4,151,153

CROSS-LINKABLE FILLED POLYURETHANES BASED ON UNSATURATED CYCLOALIPHATIC DIISOCYANATE

Peter L. Ashcroft, and John Crosby, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

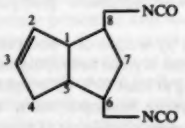
Filed Jun. 2, 1977, Ser. No. 802,967

Claims priority, application United Kingdom, Jun. 11, 1976, 24294/76

Int. Cl.² C08G 18/81, 18/86, 18/87

U.S. Cl. 260—37 N 6 Claims

1. A polyurethane elastomer cross-linked by reaction between a cross-linking agent selected from the group consisting of sulfur and peroxides and ethylenically unsaturated groups in said polyurethane wherein the polyurethane comprises urethane linked repeating units derived from a diisocyanato-bicyclo octene having the formula:



and a linear polyether or polyester prepolymer with two terminal hydroxyl groups, said ethylenically unsaturated groups being those in said bicyclo octene.

3. A polyurethane elastomer as claimed in claim 1 and filled with a calcium carbonate, titanium dioxide or coarse silica filling material.

4,151,154

SILICON TREATED SURFACES

Sidney E. Berger, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,934

The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.

Int. Cl.² C08K 9/06

U.S. Cl. 260—40 R 7 Claims

1. A composition comprising inorganic oxide particles containing on their surfaces a silane, its hydrolyzates or resulting condensate, which silane possesses at least two to about three hydrolyzable groups bonded to the silicon thereof and an organic group which contains a polyalkylene oxide group.

4,151,155

STIFFENING COMPOSITION AND METHOD

Adolph M. Chaplick, Hudson, N.H., assignor to USM Corporation, Farmington, Conn.

Division of Ser. No. 702,870, Jul. 2, 1976, Pat. No. 4,080,680. This application Oct. 6, 1977, Ser. No. 839,919

Int. Cl.² C08K 7/20, 9/06

U.S. Cl. 260—40 R 3 Claims

1. A composition for application in molten condition to areas of a material to be stiffened and hardening to stiff condition consisting essentially of a uniform mixture of synthetic polymeric material having a melt viscosity at 180° C. of from about 15,000 to about 90,000 cps. as determined by Brookfield Thermosel Viscometer with a #27 spindle and a ½ hour time, and from about 10% to about 50% by weight based on the weight of said composition of solid glass spheres having a diameter capable of passing a U.S. Sieve number 325.

4,151,156

MERCAPTO GROUP-CONTAINING SILICONE RUBBER COMPOSITIONS

Kunio Itoh, and Takeshi Fukuda, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 817,506, Jul. 20, 1977, abandoned. This application Jul. 18, 1978, Ser. No. 925,854

Claims priority, application Japan, Jul. 22, 1976, 51-86542

Int. Cl.² C08L 83/08

U.S. Cl. 260—37 SB 6 Claims

1. A mercapto group-containing silicone rubber composition consisting essentially of

(a) 100 parts by weight of a mercapto group-containing organopolysiloxane having a viscosity at least 100,000 centistokes measured at 25° C., said mercapto group-containing organopolysiloxane being represented by the following average unit formula

$$R_aSiO_{(4-a/2)}$$

wherein R stands for a substituted or unsubstituted monovalent hydrocarbon group substantially free from aliphatic unsaturation, at least two of groups R in a molecule being mercaptoalkyl groups bonded directly to the silicon atoms, and a is a number in the range from 1.98 to 2.05,

(b) from 5 to 200 parts by weight of a filler having a specific surface area of at least 50 m^2/g, and

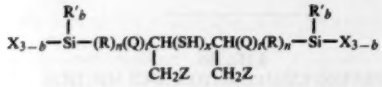
(c) from 0.1 to 10 parts by weight of a curing agent selected from the group consisting of sulfur, metal oxides and metal peroxides.

4,151,157
POLYMER COMPOSITE ARTICLES CONTAINING POLYSULFIDE SILICON COUPLING AGENTS

Thomas C. Williams, Ridgefield, Conn., and George E. Totten, Hartsdale, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

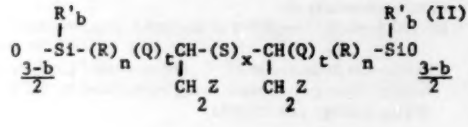
Filed Jun. 28, 1977, Ser. No. 810,853
Int. Cl.[2] C08K 9/06
U.S. Cl. 260—42.15 35 Claims

1. A polymer composite article of manufacture comprising the reaction product of a composition comprising (a) an organic polymer, (b) an inorganic substrate and (c) a polysulfide silicon coupling agent selected from the class consisting of (i) polysulfide silanes having the formula



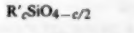
(I)

wherein R′ is hydrogen or a monovalent radical selected from the class consisting of hydrocarbon radicals and substituted hydrocarbon radicals;
wherein X is a hydrolyzable radical selected from the class consisting of alkoxy, aryloxy, acyloxy, secondary amino and aminooxy radicals;
wherein R is a divalent bridging group selected from the class consisting of hydrocarbon radicals, groups of the formula —R″OR″— and groups of the formula —R″SR″— wherein R″ is a divalent hydrocarbon radical.
wherein Q is an oxygen atom or a sulfur atom;
wherein Z is a monovalent organic amino radical the nitrogen atom of which is directly bonded to the carbon atom of the (CH_2) group of the above formula;
wherein n has a value of 0 or 1 and t has a value of 0 or 1, with the proviso that when n is 0, then t is 0; and
wherein b has a value of 0 to 2, and x has a value of 2 to 4;
(ii) polysulfide siloxane homopolymers consisting essentially of siloxy units having the formula



(II)

wherein R′, R, Q, Z, n, t, b and x are the same as defined above; and (iii) polysulfide siloxane copolymers consisting essentially of at least one siloxy unit represented by formula (II) above and at least one siloxy unit represented by the formula



(III)

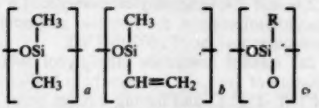
wherein R′ is the same as defined in formula (II) above, and wherein c has a value of 0 to 3 inclusive.

4,151,158
POLYMER COMPOSITION AND METHOD OF USING SAME TO PRODUCE THERMOSTABLE INSULATING MATERIALS

Isaak Y. Poddubny, Bulvar Novatorov, 28, kv. 47; Sergei V. Averyanov, prospekt Narodnogo Opolchenia, 181, kv. 18; Lidia A. Averyanova, prospekt Narodnogo Opolchenia, 181, kv. 18; Mark P. Grinblat, ulitsa Chernyshevskogo, 9, kv. 135, all of Leningrad; Rinat R. Safin, ulitsa Zhdanova, 1, kv. 99, Kazan; Alexandr K. Breger, ulitsa Polyarnaya, 10, kv. 131, Moscow; Vladimir A. Goldin, ulitsa Markhlevskogo, 11, kv. 147, Moscow; Elena Z. Branzburg, ulitsa Uralskaya, 6, korpus 2, kv. 29, Moscow; Viktor S. Kondratovsky, Pogonny proezd, 40, kv. 24, Moscow; Albert G. Kabirov, ulitsa Botanicheskaya, 13, kv. 87, Kazan; Alexandr T. Sanzharovsky, Leninsky prospekt, 99, korpus 3, kv. 186, Moscow; Valeria B. Shtukareva, Tishinskaya ploschad, 6, kv. 85, Moscow; Jury N. Svatikov, Buzheninovskaya ulitsa, 26/6, kv. 41, Moscow, and Nadezhda M. Stepanova, ulitsa Gastello, 41, kv. 78, Moscow, all of U.S.S.R.

Filed Jan. 17, 1977, Ser. No. 760,027
Int. Cl.[2] C08K 3/36
U.S. Cl. 260—42.26 9 Claims

1. A polymer composition comprising 8 to 20 parts by weight of polyborsiloxane having a molecular weight of 2,000 to 5,000 and containing structural units [BoSi] $[(CH_3)_2SiO]$ with a B:Si molar ratio of 1:4 to 5, 40 to 90 parts by weight of polysiloxane rubber, 10 to 60 parts by weight of an organic polymer selected from the group consisting of polyolefine, copolymers of olefins and dienes, halogenated polyolefins and halogenated copolymers of olefins and dienes, 2 to 10 parts by weight of branched polyorganosiloxane having a molecular weight of 2,000 to 5,000 of the general formula:



wherein: R is a radical selected from the group of radicals composed of CH_3, C_6H_5; a=43 to 50 mole %, b=0 to 2 mole %, c=50 to 55 mole %, 10 to 25 parts by weight of silicon dioxide, and 5 to 10 parts by weight of a variable valency metal oxide.

4,151,159
PLASTICS SHAPED ARTICLES

Charles L. Geall, Colchester; Leonard Leese; Donald C. Nicholas, both of Manningtree; Gordon C. R. Smith, Colchester, and Geoffrey F. Stokes, Dovercourt, all of England, assignors to Bakelite Xylonite Limited, London, England

Continuation of Ser. No. 479,156, Jun. 13, 1974, abandoned.
This application Nov. 22, 1976, Ser. No. 743,627
Claims priority, application United Kingdom, Jun. 13, 1973, 28176/73
Int. Cl.[2] B29D 7/24; C08K 3/22, 3/28; C08L 9/00
U.S. Cl. 260—42.46 10 Claims

1. A plastics composition comprising:
(a) 100 parts by weight of an olefin polymer selected from high density ethylene polymers, propylene polymers and mixtures thereof;
(b) 5 to 100 parts by weight of a non-rubbery styrene polymer selected from styrene homopolymers, styrene copolymers containing at least 50% by weight of styrene, methyl substituted styrene homopolymers, methyl substituted styrene copolymers containing at least 50% by weight of methyl styrene, copolymers of styrene and a methyl substituted styrene and mixtures thereof per hundred parts by weight of polymer (a);
(c) 0.5 to 20 parts by weight of a copolymer of isobutylene

with 1 to 3% by weight of isoprene per hundred parts by weight of polymer (a);

(d) 2 to 12 parts by weight of an ethylene/vinyl copolymer per hundred parts by weight of polymer (a); and,

(e) a compound selected from the group consisting of a filler, a pigment and mixtures thereof per hundred parts by weight of polymer (a).

7. The composition of claim 1, wherein said filler and pigment is present in an amount of up to 100 parts by weight per 100 parts by weight of component (a).

4,151,160
PROCESS FOR THE SEPARATION OF UNSAPONIFIABLE CONSTITUENTS FROM TALL OIL FATTY ACIDS

Adolf Koebner, The Retreat, St. Bees, Cumbria CA27 OBY, England

Filed Nov. 22, 1977, Ser. No. 854,035
Int. Cl.[2] C09F *1/02;* C11B *13/00;* C11C *1/10*
U.S. Cl. 260—97.6 **6 Claims**

1. A process for the separation of fatty acids from the unsaponifiable constituents of tall oil, which process consists essentially of:

A. treating the mixture of fatty acids and unsaponifiable constituents contained in a head fraction of tall oil with a source of metal cations selected from the group consisting of zinc, lead and mixtures thereof in a molar ratio of fatty acids to metal of from 1:1 to 2:1 and at a sufficient temperature to obtain a homogeneous solution of metal soaps in the unsaponifiable constituents,

B. removing the unsaponifiable constituents by vacuum distillation of said homogeneous solution at a temperature below 250° C. and optionally,

C. treating in an aqueous medium the residual metal soaps with a slight excess of an acid which is a stronger acid than the fatty acids at a temperature whereat the liberated fatty acids may be separated from the aqueous phase as an oily layer, and, optionally,

purifying said fatty acids by vacuum distillation.

4,151,161
PREPARATION OF HIGH-QUALITY GELATINE HAVING LOW CHROMIUM CONTENT FROM CHROMED WASTE STOCK

Lynton R. Smith, Oakville, Canada, assignor to Canada Packers Limited, Toronto, Canada

Filed Jun. 14, 1976, Ser. No. 695,639
Int. Cl.[2] A23J *1/10;* C09H *3/00*
U.S. Cl. 260—118 **17 Claims**

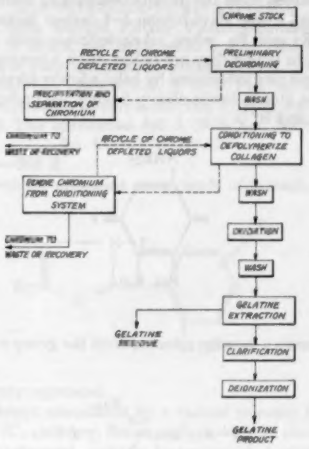
1. A process for preparing low chromium content gelatine from a chrome leather stock containing trivalent chromium, comprising:

extracting a trivalent chromium containing leather stock with a solution of a compound which forms coordination complexes with trivalent chromium to remove a major amount of chromium present in said stock;

conditioning the extracted leather stock with an alkaline solution containing sodium sulfate to partially depolymerize the collagen network of said leather stock;

oxidizing a substantial portion of the residual trivalent chromium in the conditioned leather stock to the hexavalent state by treatment with hydrogen peroxide at a pH in the range of about 10 to 12.5 under approximately ambient temperature conditions;

washing said oxidized stock to partially remove said hexavalent chromium; and



extracting gelatin from the washed leather stock with an extracting solution containing magnesium oxide or sulfate.

4,151,162
DIAZOMEROCYANINES AND MESOMERIC FORMS THEREOF

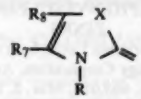
Gerard Lang, Epinay-sur-Seine, and Andrée Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 554,701, Mar. 3, 1975, Pat. No. 3,986,499, which is a continuation-in-part of Ser. No. 259,689, Jun. 5, 1972, Pat. No. 3,869,544. This application Jul. 22, 1976, Ser. No. 707,769
Claims priority, application Luxembourg, Jun. 4, 1971, 63287; Jan. 6, 1972, 64565; Aug. 30, 1974, 70835
Int. Cl.[2] A61K *7/13;* C09B *29/06, 29/08*
U.S. Cl. 260—158 **3 Claims**

1. A diazamerocyanine, including the mesomeric forms thereof, having the formula

$$A{=}N{-}N{=}B''$$

wherein A is of the formula



wherein:

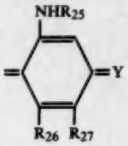
R is selected from the group consisting of lower alkyl having 1–4 carbon atoms and phenyl;

X is selected from the group consisting of oxygen; sulfur; —NR′—, wherein R′ is lower alkyl having 1–4 carbon atoms; —CR′$_9$=CR′$_{10}$ wherein R′$_9$ is hydrogen, alkyl of 1 to 4 carbon atoms or cyano and wherein R′$_{10}$ is hydrogen or alkyl of 1 to 4 carbon atoms;

wherein R″ is selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms; and —C(R″)(R′)—, wherein R″ each independently have the meaning given above;

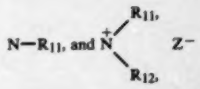
R_7 is selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, cyano and phenyl;

R_8 is selected from the group consisting of hydrogen, halogen and lower alkyl having 1–4 carbon atoms, provided that R_7 and R_8, when taken together with the carbon atoms to which they are linked, form a benzene ring or a benzene ring substituted by halo, a lower alkyl having 1–4 carbon atoms, lower alkoxy having 1–4 carbon atoms or nitro; and B'' is



wherein:

Y represents a member selected from the group consisting of



wherein R_{11}, and R_{12}, each independently represent a member selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, and z^- halide, perchlorate, fluoroborate, acetate, bisulfate or sulfate;

R_{25} represents a member selected from the group consisting of hydrogen and

wherein W represents a member selected from the group consisting of oxygen and sulfur, and R' represents a member selected from the group consisting of amino and lower alkyl having 1–4 carbon atoms; and R_{26} and R_{27} each independently represent a member selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms and methoxy; provided that R_{27} represents hydrogen when R_{11}, and R'_{12} and R_{25} represent hydrogen.

4,151,163
QUATERNIZED 1-(PYRAZOLINYLPHENYLSULPHONYL)-PIPERAZINES

Eduard Troxler, and Christian Luthi, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

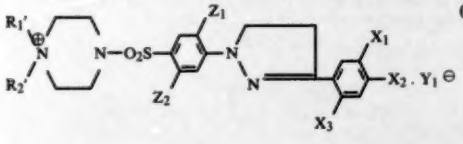
Continuation of Ser. No. 663,018, Mar. 2, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,725

Claims priority, application Switzerland, Mar. 6, 1975, 2849/75

Int. Cl.[2] C07D *241/50*

U.S. Cl. 260—239.7 **5 Claims**

1. (Pyrazolinylphenylsulphonyl)-piperazines of the formula



(2)

wherein

R_1' represents an alkyl radical having 1 to 18 carbon atoms, the benzyl radical, a benzyl radical substituted by chlorine or methyl, a cyanoalkyl radical having 1 to 4 carbon atoms, or a carbalkoxyalkyl radical having a total of 3 to 17 carbon atoms, or the allyl radical,

R_2' represents an alkyl radical having 1 to 18 carbon atoms, the benzyl radical, a benzyl radical substituted by chlorine or methyl, a cyanoalkyl radical having 1 to 4 carbon atoms, or a carbalkoxyalkyl radical having a total of 3 to 17 carbon atoms, the phenyl radical, or a phenyl radical substituted by chlorine, methyl or methoxy,

X_1 represents hydrogen or chlorine,

X_2 represents hydrogen, chlorine, fluorine, or an alkyl radical having 1 to 4 carbon atoms,

X_3 represents hydrogen, chlorine, or an alkyl radical having 1 to 4 carbon atoms,

Z_1 and Z_2 each independently represent hydrogen, chlorine or fluorine, and

Y_1 represents halogen, CH_3SO_4, $C_2H_5SO_4$, or phenylsulphonate which in the phenyl radical is unsubstituted or substituted by chlorine or methyl.

4,151,164
PROCESS FOR PREPARING 3-METHOXY-4-(4'-AMINOBENZENESULFONAMIDO)-1,2,5-THIADIAZOLE

Kurt Menzl, and Rudolf Franzmair, both of Linz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Jan. 10, 1978, Ser. No. 868,423

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701632

Int. Cl.[2] C07D *285/10*

U.S. Cl. 260—239.95 **2 Claims**

1. In a process for preparing substantially pure 3-methoxy-4-(4'-aminobenzenesulfonamido)-1,2,5-thiadiazole by reacting 3-methoxy-4-chloro-1,2,5-thiadiazole with sulfanilamide in the presence of acid binding agents in a solvent, the improvement which comprises reacting the thiadiazole compound with the sulfanilamide at a temperature of from ambient temperature up to 95° C. in dimethylsulfoxide as the solvent and in the presence of a hydroxide or a carbonate of sodium or potassium, using from 1.2 to 1.5 moles of sulfanilamide and from 1.5 to 3 moles of the hydroxide or carbonate of sodium or potassium per mole of 3-methoxy-4-chloro-1,2,5-thiadiazole, whereafter the reaction product is obtained by acidification followed by purification by recrystallization.

4,151,165
PROCESS FOR PREPARATION OF N,N'-DISUBSTITUTED-4,4'-BIPYRIDYLIUM SALT

Masaaki Shiga, Tokyo; Teruyuki Misumi, and Takashi Tanaka, both of Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,408

Claims priority, application Japan, Mar. 29, 1977, 52/34037; Dec. 13, 1977, 52/148852

Int. Cl.[2] C07D *213/22*

U.S. Cl. 546—257 **11 Claims**

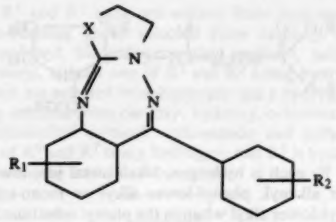
1. A process for the preparation of an N,N'-disubstituted-4,4'-bipyridylium salt, which consists essentially of treating an N,N'-disubstituted tetrahydro-4,4'-bipyridyl with at least one aromatic nitro compound in the presence of water and substantially in the absence of oxygen, said water being employed in an amount of at least 100 moles per mole of the N,N'-disubstituted tetrahydro-4,4'-bipyridyl.

4,151,166
TRICYCLIC COMPOUNDS

Donald L. Trepanier, and Thomas C. Britton, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 769,126, Feb. 16, 1977, Pat. No. 4,094,871. This application Feb. 13, 1978, Ser. No. 877,062
Int. Cl.[2] C07D *277/60*
U.S. Cl. 260—306.7 T 3 Claims

1. A compound having the formula



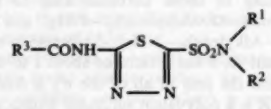
wherein R_1 and R_2 independently represent hydrogen, lower alkyl, or halo and X represents sulfur or a secondary amine having the structure H—N< and further including the pharmaceutically-acceptable salts thereof.

4,151,167
5-ACYLAMINO-1,3,4-THIADIAZOLE-2-SULFONAMIDES

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 743,543, Nov. 22, 1976, Pat. No. 4,097,263. This application Oct. 5, 1977, Ser. No. 839,671
Int. Cl.[2] C07D *285/12*; A01N *9/16, 9/22*
U.S. Cl. 260—306.8 D 8 Claims

1. The compound having the structural formula



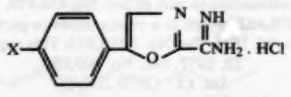
in which R^1 and R^2 are methyl and R^3 is cyclopropyl.

4,151,168
5-PHENYL-2-OXAZOLE CARBOXIMIDAMIDES AS ANTIDEPRESSANTS

Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,827
Int. Cl.[2] C07D *263/34*
U.S. Cl. 260—307 R 4 Claims

1. A compound of the formula:



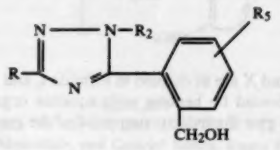
wherein X is hydrogen, nitro or chloro.

4,151,169
PROCESS FOR PREPARING SUBSTITUTED 1,2,4-TRIAZOLE DERIVATIVES

Amedeo O. Sale; Giorgio Pifferi; Pietro Consonni; Alberto Diena, all of Milan, and Bonaccorso R. Del Turco, Saronno Varese, all of Italy, assignors to Gruppo Lepetif, Milan, Italy

Division of Ser. No. 720,479, Sep. 3, 1978, Pat. No. 4,119,635, which is a continuation-in-part of Ser. No. 272,105, Jul. 17, 1972, abandoned. This application Jul. 3, 1978, Ser. No. 921,911
Int. Cl.[2] C07D *249/08*
U.S. Cl. 260—308 R 1 Claim

1. A process for preparing compounds of formula

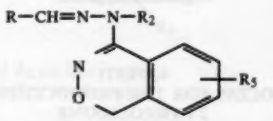


wherein R may represent:

phenyl; phenyl substituted by a radical selected from (C_{1-4})alkyl, (C_{1-4})alkoxy, fluoro, chloro, bromo, nitro, amino, cyano, carbamoyl, carboxy, hydroxymethyl, methylenedioxy and trifluoromethyl; dichlorophenyl; dimethoxyphenyl;

3,4,5-trimethoxyphenyl;

R_2 represents a (C_{1-4})alkyl group and R_5 stands for hydrogen or chloro, which comprises subjecting to thermal or acid-catalyzed rearrangement a benzoxazine derivative of formula



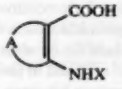
wherein R, R_2 and R_5 are as above defined.

4,151,170
PROCESS FOR THE MANUFACTURE OF INDIGOID DYES

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 16, 1976, Ser. No. 751,223
Claims priority, application Switzerland, Dec. 24, 1975, 16782/75
Int. Cl.[2] C09B *7/00*
U.S. Cl. 260—323 9 Claims

1. A process for the manufacture of indigo Compounds wherein a functional derivative of the anthranilic acid of the general formula I



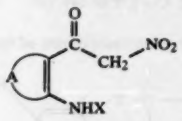
(I)

in which

A is unsubstituted or substituted benzene, naphthalene, anthracene, phenanthrene, fluorene, acenaphthene, pyrene, quinoline or phenothiazine, wherein the substituent is selected from the group consisting of alkylene, aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radicals, etherified hydroxyl groups and halogen atoms,

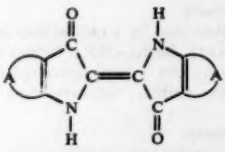
x represents a hydrogen atom or a protective group for the free amino group which can form an anhydro derivative with the carboxyl group in the ortho-position, said protective group being the acyl radical of a substituted or unsub-

stituted aliphatic, cycloaliphatic, cycloaliphtic-aliphatic, aromatic, araliphatic carboxylic acid or of a carbonic acid hemiester or carbonic acid, is reacted with nitromethane in the presence of a base selected from the group consisting of alkali metal hydrides, alkali metal amides, alkali metal alcoholates of lower alkanols or alkali base or with a salt of nitroacetic acid to give the ω-nitro-o-amino-acetophenone derivative of the general formula II



(II)

in which A and X are as defined in formula I, and this intermediate is condensed by heating with aqueous organic or inorganic acid to give the indigo compound of the general formula III



(III)

in which A is as defined in formula I.

4,151,171

PROCESS FOR THE PRODUCTION OF 2-PYRROLIDONE

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 750,310, Dec. 13, 1976, Pat. No. 4,113,735. This application Jun. 9, 1978, Ser. No. 914,107

Int. Cl.[2] **C07D** *207/26, 207/00*

U.S. Cl. 260—326.5 E **10 Claims**

1. A process for producing N-acetyl-2-pyrrolidone which comprises contacting N-acetyl-allylamine with a catalyst of palladium or platinum, coordinated with an aryl phosphine selected from the group consisting of triphenylphosphine; diphenyl-n-butyl phosphine; tri-(p-methylphenyl)-phosphine and tri-(p-methoxyphenyl)-phosphine, and carbon monoxide, neat, and in the absence of water in a reaction zone, at temperatures in the range of about from 80° to 250° C. and a carbon monoxide partial pressure above 100 psig, and wherein about from 10 to 200 mols of said aryl phosphine is used per mol of said palladium or platinum.

5. A process for producing 2-pyrrolidone which comprises: (a) contacting N-acetyl-allylamine with a triphenylphosphine-coordinated palladium or platinum catalyst and carbon monoxide in the presence of acetic acid and in the absence of water in a reaction zone, at a temperature between 50° and 200° C. and at a carbon monoxide partial pressure above 100 psig, to thereby obtain N-acetyl-2-pyrrolidone; (b) heating the N-acetyl-2-pyrrolidone from step (a) with allylamine at a temperature of 50° to 100° C. to thereby transfer the acetyl group from the N-acetyl-2-pyrrolidone to the allylamine and obtain N-acetyl-allylamine; and (c) separating 2-pyrrolidone from the reaction product of step (b) and recycling the remaining N-acetyl-allylamine as feed to step (a).

6. The process of claim 1 wherein said process is conducted at carbon monoxide partial pressures in the range of about from 100 psig to 10,000 psig.

4,151,172

PHOSPHONOACYL PROLINES AND RELATED COMPOUNDS

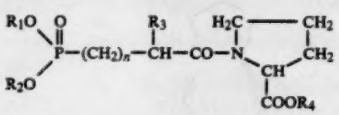
Miguel A. Ondetti, Princeton, and Edward W. Petrillo, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 823,818, Aug. 11, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,177

Int. Cl.[2] **C07D** *207/16*

U.S. Cl. 260—326.2 **19 Claims**

1. A compound of the formula



wherein

R_1 and R_2 each is hydrogen, alkali metal ion, lower alkyl, lower alkenyl, phenyl-lower alkyl or mono-substituted phenyl-lower alkyl wherein the phenyl substituent is nitro, halo or lower alkyl;

R_3 is hydrogen or lower alkyl;

R_4 is hydrogen, lower alkyl, phenyl-lower alkyl or alkali metal ion; and

n is 0 or 1.

4,151,173

ACYLATED POLYOXYALKYLENE POLYAMINES

Paul W. Vogel, Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 144,262, May 17, 1971, Pat. No. 3,806,456. This application May 25, 1973, Ser. No. 364,217

Int. Cl.[2] **C07G** *103/87;* **C08G** *73/02;* **C07C** *207/40*

U.S. Cl. 260—326.5 F **17 Claims**

1. An oil soluble acylated-nitrogen composition, having demulsifying characteristics, obtained by the acylation of (I) at least one polyoxyalkylene polyamine, having an average molecular weight of at least about 200, and selected from the group consisting of those corresponding to the formula, $H_2N—Alkylene\text{-}(—O—Alkylene)_m—NH_2$, and $R—[—Alkylene—(—O—Alkylene)_n—NH_2]_{3\text{-}6}$, wherein m has a value of about 3 to about 70, n has a value of about 1 to about 40 with the proviso that the sum of all of the n's is from about 3 to about 70 and R is a polyvalent saturated hydrocarbon radical of up to 10 carbon atoms and has a valence of 3 to 6; with (II) at least one carboxylic acid acylating agent selected from the group consisting of carboxylic acids, anhydrides, lower alkyl esters derived from monohydric lower aliphatic alcohols, and halides, and having at least 8 aliphatic carbon atoms; wherein the total amount of (I) and (II) used in the acylation is such that there is at least 0.001 equivalent of (I) per equivalent of (II).

4,151,174

1:1 ADDUCTS OF INDOLE AND (NA)PHTHALALDEHYDIC ACID

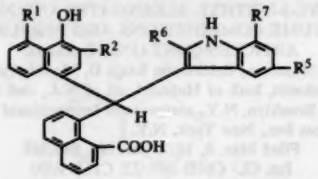
Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 691,889, Jun. 1, 1976, Pat. No. 4,036,863, which is a continuation-in-part of Ser. No. 456,870, Apr. 1, 1974, Pat. No. 3,976,662, which is a continuation-in-part of Ser. No. 202,615, Nov. 26, 1971, Pat. No. 3,816,453. This application Jun. 22, 1977, Ser. No. 809,058

Int. Cl.[2] **C07D** *209/04*

U.S. Cl. 260—326.13 R **8 Claims**

1. A compound of the formula:



wherein R^1 and R^2 each are selcted from hydrogen and a hydrogen-bonding group selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, sulfonamido and sulfamoyl, at least one of R^1 and R^2 being hydrogen; R^6 and R^7 each are selected from hydrogen and a hydrogen-bonding group selected from carboxy, hydroxy, o-hydroxyphenyl, bis trifluoromethyl carbinol, sulfonamido and sulfamoyl, at least one of R^6 and R^7 being hydrogen, and R^5 is hydrogen or alkoxy containing 1 to 18 carbon atoms.

4,151,175

METHOD FOR MAKING DIARYLHALONIUM SALTS

James V. Crivello, Clifton Park, and Julia H. W. Lam, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,116
Int. Cl.² C07D *403/02*
U.S. Cl. 260—326.26 **6 Claims**

1. In a method for making bisulfate salts of the formula,

$$[(R)_a(R^1)_bI]^+[HSO_4]^-,$$

where R is a monovalent aromatic organic radical selected from the class consisting of aromatic carbocyclic or heterocyclic having from 6–20 carbon atoms, R^1 is a divalent aromatic organic radical, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1, and the sum of a+b is equal to 1 or 2, or the valence of I, which comprises

(A) effecting a coupling reaction between a $C_{(6-30)}$ aromatic compound and potassium iodate in the presence of a mixture consisting essentially of acetic acid, acetic anhydride and sulfuric acid, and

(B) recovering the resulting diaryliodonium bisulfate salt from the mixture of (A),

wherein the improvement comprises substituting methylene chloride for the acetic acid to produce an acetic acid-free mixture in the coupling reaction, which is conducted at a temperature in the range of from −25° C. to +25° C., whereby improved yields of diaryliodonium bisulfate salt and shorter reaction times are achieved.

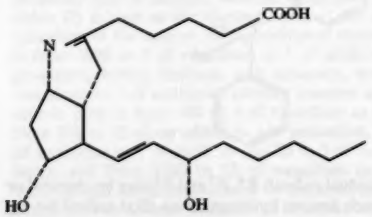
4,151,176

BIOPRECURSORS OF 9-DEOXY-6,9α-NITRILO-PGF$_1$

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

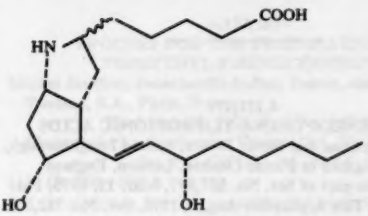
Continuation-in-part of Ser. No. 807,514, Jun. 17, 1977, Pat. No. 4,097,489. This application May 30, 1978, Ser. No. 910,412
Int. Cl.² C07D *209/52*; A61K *31/40*
U.S. Cl. 260—326.27 **1 Claim**

1. A bioprecursor of a prostaglandin analog of the formula



-continued

or



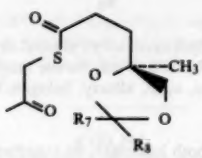
4,151,177

SYNTHESIS OF OPTICALLY ACTIVE VITAMIN E

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

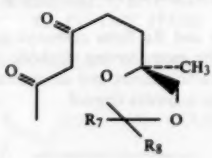
Division of Ser. No. 797,712, May 17, 1977, Pat. No. 4,113,740. This application Apr. 12, 1978, Ser. No. 895,424
Int. Cl.² C07D *317/10*
U.S. Cl. 260—340.9 R **4 Claims**

1. A compound of the formula



wherein R_7 and R_8 are lower alkyl.

3. A compound of the formula



wherein R_7 and R_8 are lower alkyl.

4,151,178

METHOD OF SYNTHESIZING FATTY ACID ESTERS OF ASCORBIC ACID

Paul A. Seib, Manhattan, Kans.; Raymond C. Cousins, Washington, Mo., and Russell C. Hoseney, Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 729,646, Oct. 5, 1976, abandoned. This application Jan. 27, 1978, Ser. No. 872,994
Int. Cl.² C07D *307/62*
U.S. Cl. 260—343.7 **8 Claims**

1. A process of preparing fatty acid esters of ascorbic acid, comprising the steps of:

preparing a homogeneous mixture comprising respective quantities of (1) a member selected from the group consisting of the isomers of ascorbic acid, (2) sulfuric acid having a concentration of from about 95 to 100%, and (3) a saturated fatty acid having from 12 to 18 carbon atoms, inclusive,

said fatty acid being present in a molar excess relative to said member,

the molar ratio of the sum of said fatty acid and member to said concentrated sulfuric acid being from about 0.1 to 0.3

allowing said mixture to react to form an ester of said fatty acid; and

recovering said fatty acid ester.

4,151,179

2-(4H-1-BENZOPYRAN-6-YL)PROPIONIC ACIDS

Richard A. Appleton, and Kevan Brown, both of Loughborough, England, assignors to Fisons Limited, London, England

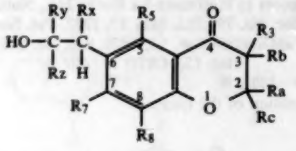
Continuation-in-part of Ser. No. 557,897, Mar. 12, 1975, Pat. No. 4,057,641. This application Aug. 9, 1976, Ser. No. 712,603

Claims priority, application United Kingdom, Aug. 22, 1975, 34871/70; Aug. 22, 1975, 34872/70

Int. Cl.[2] C07D *311/22;* A61K *31/35*

U.S. Cl. 260—345.2 **15 Claims**

1. A compound of the formula



in which Ra is hydrogen, alkyl, alkenyl or phenyl,

R_3, R_5, R_7 and R_8, which may be the same or different, are each hydrogen, alkyl, alkoxy, halogen, hydroxy, alkenyl or phenyl,

Rx is alkyl,

Ry and Rz are both hydrogen, or together represent a carbonyl oxygen atom,

Rb and Rc are both hydrogen, or together represent a carbon-carbon bond,

Ra, Rx, R_3, R_5, R_7 and R_8 each containing up to 10 carbon atoms,

and, where Ry and Rz form carbonyl, pharmaceutically acceptable salts, esters having alcoholic residues containing up to 10 carbon atoms, and unsubstituted or mono- or di-alkyl C 1 to 6 amides thereof.

4,151,180

CHROMONE DERIVATIVES

Akira Nohara, Kyoto; Tomonobu Umetani, and Yasushi Sanno, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

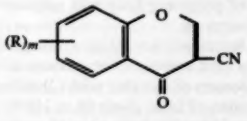
Division of Ser. No. 349,848, Apr. 10, 1973, Pat. No. 3,896,114. This application Nov. 18, 1974, Ser. No. 524,939

Claims priority, application Japan, Apr. 12, 1972, 48-37235

Int. Cl.[2] C07D *311/22*

U.S. Cl. 260—345.2 **10 Claims**

1. A compound of the formula



wherein m is 2 and each R when taken alone represents straight or branched alkyl up to 6 carbon atoms or when taken together represent butadienylene (—CH=CH—CH=CH—) which forms a benzene ring with any two adjacent carbon atoms at positions 5, 6, 7 and 8.

4,151,181

MALTYL-2-METHYL ALKENOATES AND NOVEL PERFUME COMPOSITIONS AND PERFUMED ARTICLES CONTAINING SAME

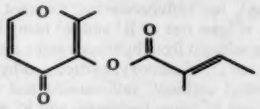
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 8, 1978, Ser. No. 884,381

Int. Cl.[2] C07D *309/22;* C11B *9/00*

U.S. Cl. 260—345.8 R **1 Claim**

1. Maltyl tiglate having the structure:



4,151,182

PRODUCTION OF ANTHRAQUINONE

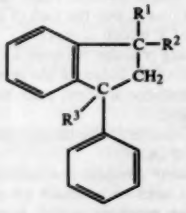
Heinz Engelbach, Limburgerhof; Hermann Wistuba; Michael J. Sprague, both of Mannheim; Hans-Juergen Sturm, and Herbert Armbrust, both of Gruenstadt, all of Fed. Rep. of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 689,170, May 24, 1976, abandoned, which is a continuation of Ser. No. 146,447, May 24, 1971. This application May 9, 1977, Ser. No. 795,162

Int. Cl.[2] C07C *45/00;* C09B *1/00*

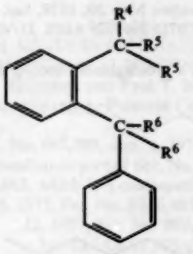
U.S. Cl. 260—369 **8 Claims**

1. A process for the production of anthraquinone which comprises oxidizing with oxygen in the gas phase, in the presence of a catalyst, an indan having the formula:



(I)

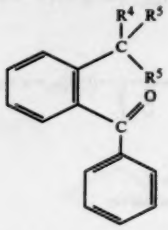
where R^1, R^2 and R^3 may be identical or different and each denotes an alkyl radical, R^1 and/or R^3 may also each denote hydrogen wherein the reaction is carried out with an indan having the formula (I) in the presence of a catalyst consisting essentially of a vanadium (V) compound and a compound of an element selected from the group consisting of potassium, boron, thallium, antimony and/or caesium, or a diphenylmethane derivative having the formula:



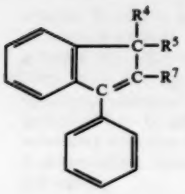
(II),

where the individual radicals R^4, R^5 and R^6 may be identical or different and each denotes hydrogen or an alkyl radical having

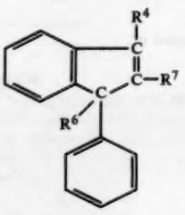
one to eight carbon atoms, or a benzophenone derivative having the formula


(III),

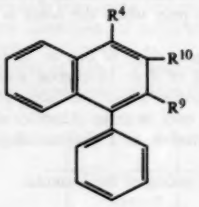
where R^4 and R^5 have the meanings given above, or an indene having the formula


(VI),

or


(VII),

or an naphthalene derivative having the formula


(VIII),

wherein R^4, R^5, R^6 and R^7 have the meanings given above, R^9 and R^{10} may be identical or different and each denotes hydrogen, or one of the two denotes hydrogen and the other an alkyl radical having one to six carbon atoms, or R^9 and R^{10} each denotes an alkyl radical and the two radicals having together two to six carbon atoms, as starting material in the presence of a catalyst consisting essentially of a vanadium (V) compound with or without additionally a compound of an element selected from the group consisting of potassium, boron, thallium, antimony and/or caesium, wherein in the process in which an indan (I) is used as the starting material the atomic ratio of vanadium in the catalyst to the additional element or elements is from 1000 to 5 of vanadium to 1 of additional element of potassium, boron, thallium, and antimony, and 2000 to 5 of vanadium to 1 of additional element caesium and wherein the atomic ratio is from 500 to 4 of vanadium to 1 of antimony, from 200 to 15 of vanadium to 1 of potassium, from 500 to 20 of vanadium to 1 of thallium and 20 to 5 of vanadium to 1 of boron and from 1000 to 12 of vanadium to 1 of caesium, wherein said additional element or elements are added to the catalysts in an amount sufficient to obtain at least about 50.9% of theory of an anthraquinone based upon the starting material recited.

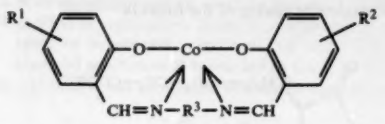
4,151,183

PROCESS FOR THE PREPARATION OF TRIMETHYL-P-BENZOQUINONE

Michel Jouffret, Francheville-le-Bas, France, assignor to Rhone Poulenc, S.A., Paris, France

Filed Oct. 23, 1974, Ser. No. 517,251
Claims priority, application France, Oct. 25, 1973, 73 38090
Int. Cl.[2] C07C *45/16, 49/64*
U.S. Cl. 260—396 R **9 Claims**

1. In a process for the preparation of trimethyl-p-benzoquinone by reacting 2,3,6-trimethylphenol with oxygen or an oxygen-containing gas in the presence of a complex cobalt salt in an inert organic solvent, the improvement which comprises using, as the complex cobalt salt, a complex cobalt salt of the general formula:


(I)

in which R^1 and R^2 each independently represents an alkoxy radical having 1–4 carbon atoms and R^3 represents an ethylene, propylene, butylene, cyclohexylene, ortho-phenylene or meta-phenylene radical.

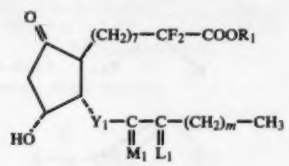
4,151,184

2,2-DIFLUORO-13,14-DIDEHYDRO-PGE$_1$ COMPOUNDS

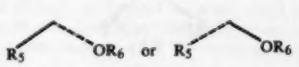
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681.
This application Mar. 7, 1977, Ser. No. 775,075
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—408 **51 Claims**

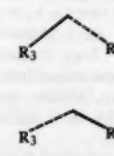
1. A prostaglandin analog of the formula:



wherein Y_1 is —C≡C—;
wherein m is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

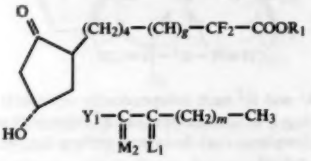


or a mixture of

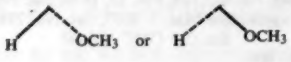
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

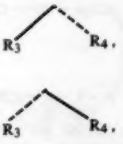
2. A prostaglandin analog of the formula



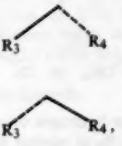
wherein Y_1 is —C≡C—;
wherein g is one, two, or 3;
wherein m is one to 5, inclusive;
wherein M_1 is



wherein L_1 is



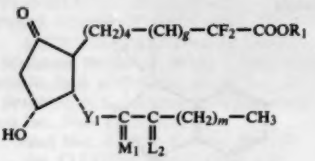
or a mixture of



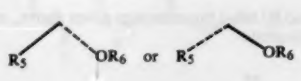
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

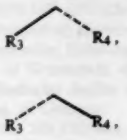
5. A prostaglandin analog of the formula:



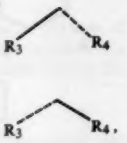
wherein Y_1 is —C≡C—;
wherein g is one, two, or 3;
wherein m is one to 5, inclusive;
wherein M_1 is



wherein L_2 is



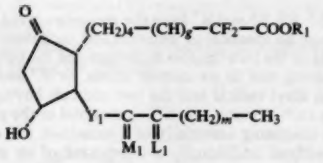
or a mixture of



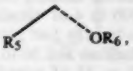
wherein one of R_3 and R_4 are methyl or fluoro and the other is hydrogen, methyl or fluoro, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl subsituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

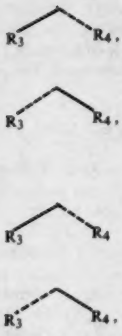
24. A prostaglandin analog of the formula:



wherein Y_1 is —C≡C—;
wherein g is one, two, or 3;
wherein m is one to 5, inclusive;
wherein M_1 is



wherein R_5 is hydrogen and R_6 is hydrogen or methyl,
wherein L_1 is



or a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,151,185

COMPLEX OR SALT OF A PLATINUM (II) COMPOUND AND A NITROGEN CONTAINING POLYMER

Harry R. Allcock, State College; Robert W. Allen, University Park, and John P. O'Brien, State College, all of Pa., assignors to Research Corporation, New York, N.Y.

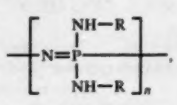
Filed May 2, 1977, Ser. No. 792,608

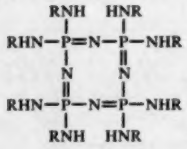
Int. Cl.² C07F *15/00*

U.S. Cl. 260—429 R **36 Claims**

1. A cis-complex or -salt of a square planar platinum compound and a nitrogen containing oligomer or polymer selected from the group consisting of polyphosphazenes, polyvinyl pyridine and polyvinylpyrrolidone.

5. A cis- complex or -salt of a square planar platinum compound and a polyphosphazene having the structural formula:





or

wherein:

n represents the degree of polymerization, and

R is alkyl, alkoxy, aryloxy, halogen.

4,151,186

PREPARATION OF ACYL CHLORIDES

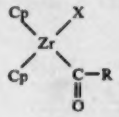
Roger L. Kidwell, Des Peres, and Gary J. Lynch, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 23, 1978, Ser. No. 880,683

Int. Cl.² C07F *7/00*

U.S. Cl. 269—429.3 **10 Claims**

1. A process which comprises contacting a compound of the formula



wherein

Cp is a π-cyclopentadienyl radical and each Cp can be the same or different,

X is an essentially non-interfering monovalent entity, and

R is alkyl or cycloalkyl, either of which may be unsubstituted or substituted, provided that the sterically least hindered position of R is bonded to C=O in the formula,

with chlorine in the substantial absence of light to form

and

4,151,187

INTERMEDIATES FOR PROSTAGLANDIN SYNTHESIS

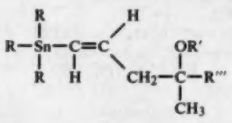
Paul W. Collins, Deerfield, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 22, 1977, Ser. No. 770,536

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **7 Claims**

1. A compound of the formula



wherein R is phenyl, cyclohexyl or lower alkyl having 1-6 carbon atoms; R′ is hydrogen or trialkylsilyl wherein the alkyl contains 1-4 carbon atoms; and R‴ is butenyl or butynyl.

4,151,188

ARSENAMIDE COMPOUND

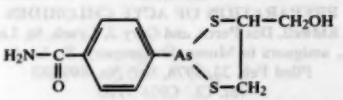
Ernst A. H. Friedheim, 5, Ave. Marc Monnier, Geneva, Switzerland

Division of Ser. No. 380,364, Jul. 18, 1973, Pat. No. 3,856,971, which is a continuation-in-part of Ser. No. 339,843, Mar. 9, 1973, Pat. No. 3,842,171. This application Jul. 12, 1974, Ser. No. 488,067

Int. Cl.² C07F *9/78*; A61K *31/285*

U.S. Cl. 260—440 **1 Claim**

1. The compound of the formula



4,151,189
SYNTHESIZING LOW SODIUM CRYSTALLINE ALUMINOSILICATE ZEOLITES WITH PRIMARY AMINES

Mae K. Rubin, Bala Cynwyd, Pa.; Edward J. Rosinski, Pedricktown, and Charles J. Plank, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 879,337, Feb. 23, 1978, abandoned, which is a continuation of Ser. No. 395,213, Sep. 7, 1973, abandoned. This application Apr. 10, 1978, Ser. No. 894,887

Int. Cl.[2] C07F 5/06

U.S. Cl. 260—448 C **14 Claims**

1. In a method for synthesizing a crystalline aluminosilicate zeolite containing an organic nitrogen cation and selected from the group consisting of ZSM-5, ZSM-12, ZSM-35 and ZSM-38, wherein a reaction mixture comprising sources of silica, alumina, alkali metal, water and organo nitrogen cation precursor is prepared and maintained under conditions of temperature and pressure to effect crystallization of said aluminosilicate zeolite, the improvement wherein said precursor consists of a primary amine having 2 to 9 carbon atoms, wherein said zeolite contains, in the as-synthesized form, less than 0.14% by weight of alkali metal and wherein said mixture is stirred during the synthesis of said zeolite.

4,151,190
PROCESS FOR PRODUCING C_2–C_4 HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

Craig B. Murchison, Midland, and Dewey A. Murdick, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 688,861, May 21, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,761

Int. Cl.[2] C07C 1/04

U.S. Cl. 260—449 R **30 Claims**

1. In a process for producing hydrocarbons by contacting carbon monoxide and hydrogen at reactive conditions, the improvement which comprises increasing the yield of the saturated and unsaturated hydrocarbons containing from two to four carbon atoms by contacting the carbon monoxide and hydrogen with a catalyst consisting of:

(A) between about 1 percent and about 95 percent by weight based upon the weight of the catalyst of at least one material selected from the group consisting of the metal, oxide or sulfide of molybdenum, tungsten, rhenium, ruthenium and platinum;

(B) between about 0.05 percent and about 50 percent by weight based upon the weight of the catalyst of at least one material selected from the group consisting of the hydroxide, oxide or salt of lithium, sodium, potassium, rubidium, cesium, magnesium, calcium, strontium, barium and thorium; and

(C) at least about 1 percent by weight based upon the weight of the catalyst of a support.

4,151,191
SULFUR RESISTANT MOLYBDENUM CATALYSTS FOR METHANATION

John Happel, Hastings-on-Hudson, N.Y., and Miguel A. Hnatow, Verona, N.J., assignors to The American Gas Association, Arlington, Va.

Filed Nov. 14, 1977, Ser. No. 851,556

Int. Cl.[2] C07C 27/06

U.S. Cl. 260—449 M **7 Claims**

1. A process for producing methane, and other gaseous hydrocarbons from hydrogen and carbon monoxide by contacting a gaseous mixture containing hydrogen, carbon monoxide, and gaseous compounds of sulfur in concentrations of up to 30,000 ppm with a catalyst comprising oxygen compounds of an element selected from the group consisting of the lanthanide elements and the actinide elements and oxygen compounds of molybdenum, the atomic ratio of said elements to molybdenum being about 9 to 1.

4,151,192
PROMOTING N-PROPYL ALCOHOL FORMATION WITH VANADIUM COMPOUNDS

Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 16, 1978, Ser. No. 906,585

Int. Cl.[2] C07C 27/06, 31/02, 31/20

U.S. Cl. 260—449 L **13 Claims**

1. A process for producing alkane monohydric and polyhydric alcohols in a homogeneous liquid phase mixture which comprises reacting hydrogen and oxides of carbon in the presence of a rhodium carbonyl complex and a compound of vanadium selected from the group consisting of vanadate esters, vanadium alkanedionates, alkanolamine vanadates, vanadium oxides, vanadium carbonyls, vanadyl carboxylates and salts containing vanadium oxyanions, at a temperature between about 100° C. and about 375° C. and a pressure between about 500 psia and about 50,000 psia to produce said alkane alcohols.

4,151,193
PROCESS FOR THE PREPARATION OF ALIPHATIC ISOCYANATES

Michel Crochemore, Oullins, France, assignor to Philagro, Lyons, France

Filed Dec. 12, 1977, Ser. No. 859,930

Claims priority, application France, Dec. 27, 1976, 76 39801

Int. Cl.[2] C07C 118/00

U.S. Cl. 260—453 P **10 Claims**

1. A process for manufacturing aliphatic isocyanates by phosgenation of substituted symmetric ureas, comprising reacting phosgene at a temperature between 150° and 350° C. with a disubstituted symmetric NN′ urea as follows:

$$RNHCONHR + COCl_2 \rightarrow 2RNCO + 2HCl$$

in which R is an alkyl radical with 1 to 6 carbon atoms, dissolved in an inert organic solvent with a boiling point more than 150° C.

4,151,194
DICYANOTRICYCLODECANE

Ching-Yong Wu, O'Hara Township, Allegheny County, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 12, 1977, Ser. No. 859,386

Int. Cl.[2] C07C 120/02, 121/46

U.S. Cl. 260—464 **2 Claims**

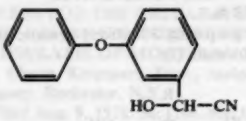
1. A mixture of dicyanotricyclodecane isomers comprising 3,8-dicyanotricyclo[5.2.1.0]decane and 4,8-dicyanotricyclo[5.2.1.0]decane.

4,151,195
NOVEL RACEMIZATION PROCESS

Julien Warnant, Neuilly-sur-Seine; Jacques Prost-Marechal, Paris, and Philippe Cosquer, St. Denis, all of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 22, 1977, Ser. No. 789,843
Claims priority, application France, Apr. 23, 1976, 76 12093
Int. Cl.[2] C07C *121/75*
U.S. Cl. 260—465 D **25 Claims**

1. A process for the preparation of an ester of chiral (A) acid with a racemic (R,S) α-cyano-3-phenoxybenzyl alcohol (B) comprising reacting an ester of chiral (A) acid with α-cyano-3-phenoxybenzyl alcohol of the formula



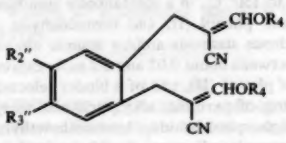
in its optically active (R) form or (S) form or a mixture of esters of said (R) alcohol and (S) alcohol in non-equimolecular proportions with a base selected from the group consisting of ammonia, primary, secondary and tertiary amines, quaternary ammonium compounds, liquid amines of high molecular weight and a catalytic amount of a strong base in at least one solvent for the starting esters and in which the ester of racemic alcohol is soluble and recovering from the resulting solution the ester of chiral (A) acid with racemic (R,S) alcohol.

4,151,196
CYANO-ENOL ETHERS

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 770,322, Feb. 18, 1977, abandoned, which is a division of Ser. No. 590,755, Jun. 26, 1975, Pat. No. 4,033,962. This application Jul. 3, 1978, Ser. No. 921,646
Int. Cl.[2] C07C *121/75*
U.S. Cl. 260—465 F **2 Claims**

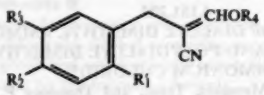
1. A compound of the formula



III

wherein R_2'' and R_3'' are, independently, lower alkoxy, and R_4 is lower alkyl.

2. A compound of the formula



VIII

wherein R_1', R_2' and R_3' are hydrogen, lower alkyl, lower alkoxy or lower alkenyl, provided that at least one of R_1', R_2' and R_3' is lower alkenyl, and R_4 is lower alkyl.

4,151,197
DIMERIZATION PROCESS

Olav T. Onsager, Suffern, N.Y., assignor to Halcon International, Inc., New York, N.Y.

Division of Ser. No. 537,295, Dec. 30, 1974, Pat. No. 3,954,831. This application Nov. 10, 1975, Ser. No. 630,227
Int. Cl.[2] C07C *121/20*
U.S. Cl. 260—465.8 D **4 Claims**

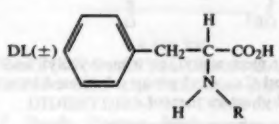
1. A process for the dimerization of acrylonitrile to produce 2-methylene glutaronitrile which comprises reacting said acrylonitrile in the liquid phase at a temperature of 10 to 150° C. in the presence of a catalyst consisting essentially of (a) at least one metal compound of the formula $M(X)_n$ wherein M is Zn or Co, X is an anion of an unsubstituted alkyl sulfonic acid and n is a number equal to the valence of the metal M divided by the number of equivalents of X; and (b) at least one nitrogen-containing Lewis Base which is (1) a tertiary poly-functional amine which contains at least two Lewis Base nitrogen groups separated from each other by at least one carbon atoms, and which are (a) N-disubstituted amino groups wherein each N-substituent is the same or different and is an alkyl, cycloalkyl, benzyl or aryl radical, or (b) N-heterocyclic groups containing 3 to 20 carbon atoms; or (2) a mono nitrogen-containing N-substituted heterocyclic amine containing 3 to 20 carbon atoms in the heterocyclic ring wherein the N-substituent is an alkyl, cycloalkyl, benzyl or aryl radical, wherein the Lewis Base/metal compound mole ratio is from 0.1:1 to 25:1, each radical, and each heterocyclic group or ring may be unsubstituted or substituted by non-reactive groups, each alkyl radical contains 1 to 20 carbon atoms and each aryl radical contains 6 to 20 carbon atoms.

4,151,198
RESOLUTION OF N-ACYL-DL (+)-PHENYLALANINES

Imre A. Halmos, Summit, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 2, 1978, Ser. No. 911,841
Int. Cl.[2] C07C *101/08*
U.S. Cl. 260—501.11 **6 Claims**

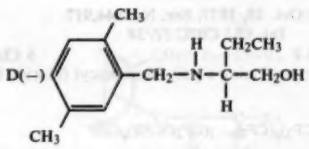
1. A process for resolving racemic N-acyl-DL(±)-phenylalanine represented by formula (I)



(I)

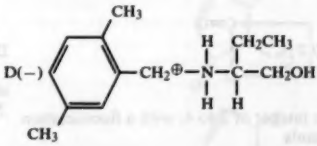
wherein R represents an acyl radical selected from C_1-C_8 alkanoyl, or benzoyl, comprising:

(a) reacting about one mole of said compound of formula (I) with about one mole of D(−)-2-(2,5-dimethylbenzylamino)-1-butanol, represented by formula (II),

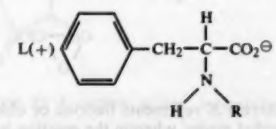


(II)

in an aqueous medium at a temperature of about 50°-90° C. to form an essentially saturated solution of a compound represented by formula (III)



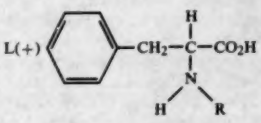
(III)



wherein R is as previously defined,

(b) cooling said essentially saturated solution to crystallize said compound of formula (III), and recovering the same,

(c) reacting said compound of formula (III) in an aqueous medium with an acid or alkalizing agent to form an optically pure N-acyl-L(+)-phenylalanine represented by formula (IV)



(IV)

and recovering the same.

4,151,199

CYCLOPENTONE PROPANOIC ACID COMPOUNDS

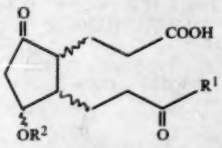
William Dawson, Camberley; Michael J. Foulis, Bracknell; Norman J. A. Gutteridge, Owlsmoor, Nr. Camberley, and Colin W. Smith, Bracknell, all of England, assignors to Lilly Industries Limited, London, England

Filed Dec. 4, 1975, Ser. No. 637,783

Int. Cl.[2] C07C *177/00, 61/38*

U.S. Cl. 562—504 **4 Claims**

1. Racemate or mixture of racemates of the formula:



wherein R^2 is hydrogen; acetyl, or trimethylsilyl, and R^1 is a straight or branched C_{1-8} alkyl group substituted by a COOH group; and C_{1-4} alkyl esters thereof.

4,151,200

PROCESS FOR PRODUCING POLYFLUORODIACYL FLUORIDE

Masaaki Yamabe, Machida, and Seisaku Kumai, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,917

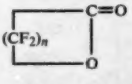
Int. Cl.[2] C07C *51/58*

U.S. Cl. 260—544 F **8 Claims**

1. A process for producing a polyfluorodiacyl fluoride having the formula

$$FOC(CFXOCF_2)_p(CF_2)_{n-1}(CF_2OCFX)_qCOF$$

wherein n represents an integer of 2 to 4; X represents fluorine or chlorine atom or trifluoromethyl group; p represents 0 to 5; q represents 0 to 5; and $p+q$ is more than 1, which comprises reacting a perfluorolactone having the formula:



wherein n represents an integer of 2 to 4; with a fluorocarbon epoxide having the formula

wherein X represents fluorine or chlorine atom or trifluoromethyl group; wherein the reaction is carried out under spontaneous pressure or higher at the reaction temperature of −80° C. to +200° C.

4,151,201

PROCESS FOR PREPARING 2-HYDROXYBENZOIC ALDEHYDES

Giuseppe Casnati; Giovanni Casiraghi, both of Parma; Giuseppe Puglia, Reggio Emilia; Giovanni Sartori, Vicobellignano, and Giuliana Terenghi, Parma, all of Italy, assignors to Montedison S.p.A., Milan, Italy

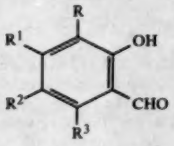
Filed Aug. 12, 1977, Ser. No. 824,090

Claims priority, application Italy, Aug. 13, 1976, 26270 A/76

Int. Cl.[2] C07C *45/00*

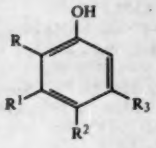
U.S. Cl. 260—562 A **8 Claims**

1. Process for preparing 2-hydroxy-benzoic aldehydes having the general formula (I):



(I)

wherein R, R^1, R^2 and R^3, which can be the same or different, represent hydrogen atoms; alkyl, aryl, cycloalkyl, alkoxyl, hydroxyl, or acylamino groups, or halogen; characterized in that a phenol of general formula (II)



(II)

wherein R, R^1, R^2 and R^3 have the same meaning as in general formula (I), is condensed with formaldehyde at temperatures of from about 90° to 150° C., in a substantially stoichiometric molar ratio between phenol (II) and formaldehyde, in the presence of anhydrous stannous and/or stannic chloride, in ratios comprised between about 0.02 and 0.2 mole expressed as Sn for one mole of phenol (II), and of a binder selected from the group consisting of pyridine, alkylpyridines, acetylpyridines, hexamethylphosphotriamide, tetramethylethylenediamine, tetramethylpropylenediamine, quinolines, quinoxalines, anilines, substituted anilines and tertiary amines, in an aprotic solvent.

4,151,202

PREPARATION OF DIALLYL DIMETHYL AMMONIUM CHLORIDE AND POLYDIALLYL DIMETHYL AMMONIUM CHLORIDE

Wood E. Hunter, Memphis, Tenn., and Theodore P. Sieder, Sauk Village, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 833,113, Sep. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 763,469, Jan. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 662,397, Mar. 1, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 934,923

Int. Cl.[2] C07C *85/04;* **C08L** *39/00*

U.S. Cl. 260—567.6 R **5 Claims**

1. A method for the preparation of a solution polymer of diallyl dimethyl ammonium halides, said polymer being prepared from an aqueous monomer solution of diallyl dimethyl ammonium halide containing suspended therein 9.0–20.0% by weight of a water soluble alkali metal halide salt and 25–50%

by weight of diallyl dimethyl ammonium halide which comprises the steps of:

A. Purging said monomer solution;

B. Heating said monomer solution to a temperature of 120°–180° F.;

C. Adding to said monomer solution a free radical catalyst;

D. Polymerizing said monomer solution under free radical forming conditions so as to prepare a polymer of dially dimethyl ammonium chloride in an aqueous solution;

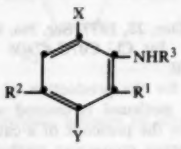
E. Cooling said polymer in aqueous solution while adding water is necessary to solubilize any of said salt contained in said solution.

4,151,203
PROCESS FOR THE PREPARATION OF P-NITROANILINE COMPOUNDS BY THE ALKALINE HYDROLYSIS OF MIXED ANILIDES

Dah-Chieh O. Cheng, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,159
Int. Cl.² C07C *85/26*
U.S. Cl. 260—582 **11 Claims**

1. Process for preparing I in an essentially pure form which comprises subjecting a lower alkanol solution of II and a lower carboxylic acid amide of I to hydrolysis conditions in the presence of sodium or potassium hydroxide and separating insoluble I thus formed from the reaction mixture, wherein I and II each is a compound or, when X and Y are different, an isomeric pair of compounds, having the formula



wherein X is halogen, lower alkyl or lower alkoxy; Y is halogen or lower alkyl; and R^1, R^2 and R^3 in the compounds or isomeric mixtures I and II are:

I: R^1 and R^3 hydrogen and R^2 is nitro; and

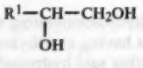
II: R^1 is nitro, R^2 is hydrogen, and R^3 is lower carboxylic acid acyl.

4,151,204
PROCESS FOR PREPARING AMINO ALCOHOLS

Yataro Ichikawa, Fuchu; Eishin Yoshisato, and Koji Nakagawa, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

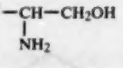
Continuation-in-part of Ser. No. 590,945, Jun. 27, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,674
Int. Cl.² C07C *89/00, 85/06;* B01J *23/40*
U.S. Cl. 260—584 R **5 Claims**

1. A process for preparing amino alcohols, which comprises reacting a dihydroxy alcohol containing one primary alcoholic hydroxyl group and one secondary alcoholic hydroxyl group and expressed by the following formula



wherein R^1 is an alkyl group,

with ammonia in the presence of a hydrogenation catalyst selected from the group consisting of a catalyst composed of cobalt and an oxide of a metal selected from the group consisting of iron, manganese, zinc, thorium, zirconium, lanthanum and uranium, and a catalyst composed of nickel and an oxide of a metal selected from the group consisting of iron, thorium and lanthanum thereby to selectively produce a monoamino-monoalcohol expressed by the following formula



wherein R^1 is as defined above,

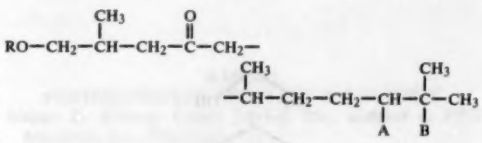
the amount of ammonia employed in the amination being at least 3 moles per mole of the starting dihydroxy alcohol.

4,151,205
SYNTHESIS OF VITAMIN E

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 639,011, Dec. 9, 1975, Pat. No. 4,051,153, which is a continuation-in-part of Ser. No. 544,163, Jan. 27, 1975, abandoned. This application Jun. 2, 1977, Ser. No. 802,747
Int. Cl.² C07C *49/82*
U.S. Cl. 260—590 R **5 Claims**

1. A compound of the formula



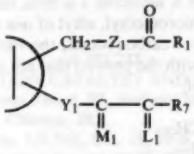
wherein R is hydrogen, tetrahydropyranyl, 4-methyl-5,6-dihydro-2H-pyranyl, benzyl, benzhydrtl, trityl, t-butyl, alpha-lower alkoxy lower alkyl, trimethylsilyl, or dimethyl-tert-butyl silyl; A and B are individually hydrogen or taken together form a carbon-to-carbon bond.

4,151,206
2-DECARBOXY-2-ALKYLCARBONYL-3,7-INTER-m-PHENYLENE-3-OXA-4,5,6-TRINOR-9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

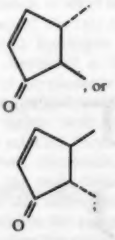
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 888,695, Mar. 21, 1978, Pat. No. 4,123,463. This application Jul. 17, 1978, Ser. No. 925,090
Int. Cl.² C07C *177/00*
U.S. Cl. 260—590 C **29 Claims**

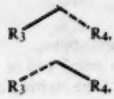
1. A prostaglandin analog of the formula



wherein D is

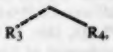


wherein R_1 is alkyl of one to 4 carbon atoms, inclusive; wherein L_1 is

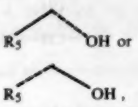


a mixture of

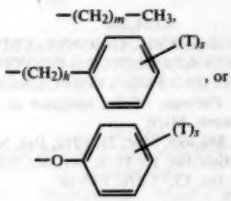
and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is

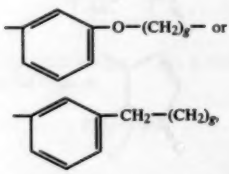


(1)

(2)

(3)

wherein h is zero to three, inclusive,
wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the variout T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
1. trans—CH=CH—,
2. cis—CH=CH—,
3. $—CH_2CH_2—$, or
4. —C≡C—; and
wherein Z_1 is



wherein g is one, two, or three.

4,151,207

PROCESS FOR PREPARATION OF 3-METHOXY-4-HYDROXYBENZALDEHYDE

Hans Evju, Sarpsborg, Norway, assignor to Borregaard Industries Limited, Sarpsborg, Norway

Continuation-in-part of Ser. No. 654,850, Feb. 3, 1976, abandoned. This application Jun. 8, 1977, Ser. No. 804,508
Claims priority, application Norway, Feb. 10, 1975, 750420
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—600 A **4 Claims**

1. In the process for the production of vanillin by the oxidation of a strongly alkaline lignin-containing waste sulfite liquor and wherein scale is deposited, the improvement comprising the steps of ultrafiltrating said waste liquor, obtaining an enriched lignin-containing fraction having a molecular weight above about 1000 and devoid of other low-molecular weight components, adding an alkaline compound to said enriched fraction to obtain a strongly alkaline enriched fraction, passing oxygen through said enriched fraction at a temperature of about 100°–185° C. to oxidize said enriched fraction, and recovering vanillin from said oxidized fraction, whereby scale deposition is substantially eliminated.

4,151,208

PROCESS FOR THE SELECTIVE PREPARATION OF ACETALDEHYDE FROM METHANOL AND SYNTHESIS GAS

Wayne R. Pretzer, Oakmont Borough; Thaddeus P. Kobylinski, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 23, 1977, Ser. No. 863,744
Int. Cl.[2] C07C *47/06*
U.S. Cl. 260—601 R **12 Claims**

1. In a process for the production of acetaldehyde from methanol wherein methanol is reacted with hydrogen and carbon monoxide in the presence of a catalyst, the improvement which comprises contacting methanol, hydrogen and carbon monoxide with cobalt (II) meso-tetraaromaticporphine and an iodine promoter, at a hydrogen and carbon monoxide molar ratio of from about 10:1 to about 1:10, a methanol and cobalt (II) meso-tetraaromaticporphine molar ratio of from about 1:1 to about 100,000:1, a cobalt (II) meso-tetraaromaticporphine and iodine promoter molar ratio of from about 100:1 to about 1:100, a reaction temperature of from about 150° C. to about 250° C., and a reaction pressure of from about 1000 psig. (6.83 MPa) to about 6000 psig. (40.98 MPa), for a reaction time period sufficient to convert methanol to acetaldehyde.

4,151,209

REDUCTION OF CATALYST DEACTIVATION IN PROCESSES FOR HYDROFORMYLATION OF OLEFINS WITH RHODIUM COMPLEX CATALYSTS

James L. Paul; Wendell L. Pieper, and Leslie E. Wade, all of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 685,836, May 13, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,296
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF **11 Claims**

1. In a process for hydroformylating a hydrocarbon of 2 to about 20 carbon atoms having an ethylenic double bond in the alpha position by reacting said hydrocarbon at about 80° C. to 150° C. with carbon monoxide and hydrogen in admixture with a liquid reaction medium containing as hydroformylation catalyst a complex of rhodium with a triorganophosphorus ligand and carbon monoxide to produce a liquid reaction product comprising said ligand, an aldehyde derivative of said hydrocarbon, and reaction by-products, the improvement which comprises:

continuously stripping said liquid reaction medium, by gas stripping, distillation, or evaporation during the course of

said hydroformylation reaction, to such a degree that the ratio of (a) phosphorus contained in said liquid reaction medium in the form of high-boiling organophosphorus reaction by-products excluding alkyl-substituted derivatives of said ligand formed by substitution of said olefin into said ligand molecule and also excluding oxides of said ligand and of said alkyl-substituted derivatives to (b) phosphorus contained in said reaction medium in the form of said ligand is maintained at a value not greater than about 0.2.

4,151,210

PROCESS FOR THE PRODUCTION OF PHENYLALKYL SULPHONES

Claus D. Weis, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

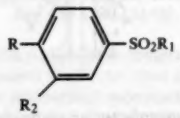
Filed Jun. 12, 1978, Ser. No. 914,652

Claims priority, application Switzerland, Jun. 23, 1977, 7720/77; Jul. 20, 1977, 9000/77

Int. Cl.² C07C *147/06*

U.S. Cl. 260—607 AR **8 Claims**

1. A process for the production of phenyalkyl sulphones of the formula

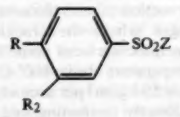


wherein

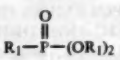
R represents hydrogen, halogen or alkyl of 1 to 4 carbon atoms,

R_1 represents alkyl of 1 to 4 carbon atoms and

R_2 represents hydrogen, and, if R is hydrogen or alkyl, also represents nitro, which comprises reacting a sulphinic acid derivative of the formula



wherein R and R_2 are as defined above and Z represents hydrogen or a salt-forming cation, with a dialkyl alkanephosphonate of the formula



wherein R_1 is as defined above.

4,151,211

BIS-(PHENOLIC)DIACETALS

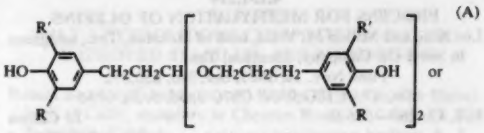
Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 6, 1978, Ser. No. 883,753

Int. Cl.² C07C *43/30, 149/36*

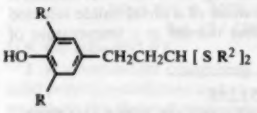
U.S. Cl. 260—609 F **4 Claims**

1. A phenolic acetal having the structural formula:



(A)

or



(B)

wherein R and R' are lower alkyl groups and R^2 is an alkyl of 6–18 carbon atoms.

4,151,212

PURIFICATION OF ETHYLENE DICHLORIDE

Walker H. Rideout, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 7, 1978, Ser. No. 922,717

Int. Cl.² C07C *17/00*

U.S. Cl. 260—659 A **5 Claims**

1. In a process of preparing ethylene dichloride by vapor phase oxychlorination of ethylene wherein a gaseous mixture of ethylene, hydrogen chloride, and oxygen are contacted at an elevated temperature with an oxychlorination catalyst to produce a chloral containing gaseous reaction product stream, condensing said stream and recovering ethylene dichloride from the condensation product, the improvement comprising reducing the chloral content of said gaseous reaction product stream by contacting the chloral containing gaseous reaction product stream with alumina prior to condensation of said stream.

4,151,213

OXIDATION CATALYST AND PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 736,564, Oct. 28, 1976, Pat. No. 4,042,531. This application Jan. 21, 1977, Ser. No. 761,443

Int. Cl.² C07C *15/00*

U.S. Cl. 260—669 R **13 Claims**

1. A process for oxidation of alkyl aromatic compounds, the alkyl moiety being attached directly to the aromatic ring and having at least one alpha hydrogen wherein the said alkyl aromatic compound is contacted in the liquid phase with an oxygen-containing gas in the presence of an oxidation catalyst consisting essentially of a milled reaction product of an anhydrous transition metal halide with silver nitrite wherein the said transition metal is selected from the group consisting of copper, manganese, cobalt, chromium, iron, nickel, vanadium, thallium and tungsten, the mole ratio of said metal halide to said silver nitrite before said milling being in the ratio of 1:1 to 1:5, at a temperature within the range of from about 100° to 250° C., at a pressure within the range of 1 to 100 atmospheres and an oxygen flow rate within the range from about 200 to 5000 cc/minute.

4,151,214

PROCESS FOR METHYLATION OF OLEFINS

Leo Kim, and Milton M. Wald, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 14, 1977, Ser. No. 850,872
Int. Cl.[2] C10G 9/04; C07C 3/56, 5/28, 9/16
U.S. Cl. 260—676 R 13 Claims

1. A method comprising reacting an olefin with methanol and a catalytically effective amount of a metal halide selected from ZnI_2, $ZnBr_2$, and mixtures thereof at a temperature of from 190° C. to 300° C.

4,151,215

METHODS AND APPLICATIONS OF PREPARATIVE SCALE CHROMATOGRAPHY

Courtenay S. G. Phillips, Oxford, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 588,908, Jun. 20, 1975, Pat. No. 4,042,350.
This application Jun. 1, 1977, Ser. No. 802,577
Claims priority, application United Kingdom, Jul. 3, 1974, 29491/74
The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.
Int. Cl.[2] C07C 1/30, 5/24
U.S. Cl. 260—677 XA 13 Claims

1. A chromatographic method for catalytically reacting at least one sorbate component to form a mixture of sorbate components and fractionating said mixture, comprising:

(a) providing a flow path of a catalytic sorbent having different affinities for the sorbate components of said mixture;

(b) feeding a starting material comprising said at least one sorbate component into said flow path of sorbent; and

(c) catalytically reacting said at least one sorbate component to form said mixture of sorbate components, and fractionating said sorbate components into an abutting succession of components for said sorbent, by thermally displacing said at least one sorbate component through said sorbent in advance of a heat zone moving relative to said sorbent, the mixture being fractionated into sorbate components in the advancing relatively cool area of sorbent ahead of said heat zone, the amount of all sorbate components remaining in said sorbent behind said heat zone being relatively insignificant.

4,151,216

CATALYTIC CRACKING OF BY-PRODUCT POLYPROPYLENE

Vernon C. Smith, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 25, 1977, Ser. No. 845,171
Int. Cl.[2] C07C 3/26
U.S. Cl. 260—683 PD 2 Claims

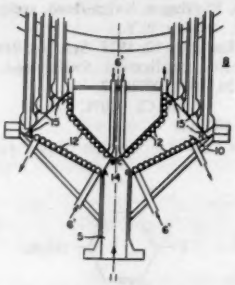
1. A process for converting by-product polypropylene to a fuel oil product having the viscosity necessary to permit it to be readily pumped and stored at the temperatures normally used for fuel oils, said process comprising the steps of heating the by-product polypropylene to a temperature in the range of from about 150° to about 350° C. to provide a molten feed material and then contacting said feed material with a silica-on-alumina catalyst containing from about 5 to about 20 percent by weight of silica in a tubular reactor at a temperature in the range of from about 425° to about 475° C. and for space times in the range of from about five to about 15 grams of the catalyst per gram of said by-product polypropylene fed to the reactor per minute.

4,151,217

METHOD OF COOLING CRACKED GASES OF LOW BOILING HYDROCARBONS

Kazutoshi Amano, Kobe; Kazuyasu Suehiro, Nishinomiya; Takehiko Sato, and Yuuji Ohnishi, both of Yokkaichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Petrochemical Company Limited, both of Tokyo, Japan

Continuation-in-part of Ser. No. 779,157, Mar. 18, 1977, abandoned, which is a continuation of Ser. No. 628,825, Nov. 4, 1975, abandoned, which is a continuation of Ser. No. 370,614, Jun. 18, 1973, abandoned. This application Dec. 8, 1977, Ser. No. 858,455
Claims priority, application Japan, Jul. 4, 1972, 47-66321
Int. Cl.[2] C07C 11/04, 3/30
U.S. Cl. 260—683 R 4 Claims



1. In a method of manufacturing olefins by the pyrolysis of hydrocarbons which assume gaseous state at room temperature under atmospheric pressure or liquid hydrocarbons having a volumetric average boiling point of below 90° C., without adding oxygen and without being accompanied by the burning of the hydrocarbons and with dilution steam in a pyrolysis furnace, at a temperature ranging from 750° to 900° C., followed by quick quenching in a multi-tubular quenching heat exchanger, the improvement which comprises maintaining the metallic surfaces of the transfer portions from the outlet portion of the pyrolysis reaction tube to the area in the said multi-tubular heat exchanger where the cracked gas is cooled quickly and which metallic surfaces come into contact with cracked gases at a temperature above 600° C. and flowing at a mass velocity of below 50 kg/m^2 per second, at a temperature below 450° C. by indirectly contacting said metallic surfaces with a water cooling medium flowing through cooling means in said transfer portion.

4,151,218

FIRE RETARDANT POLYMERS OF STYRENE AND MALEIC ANHYDRIDE

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,491
Int. Cl.[2] C08K 5/06, 5/03, 5/02
U.S. Cl. 260—836 11 Claims

1. A composition of matter having a UL-94 rating of at least V-1 and a Dm (flaming) of less than 450 which comprises:

A. a rubber modified copolymer of a styrene monomer and maleic anhydride containing from 7 to 25 percent by weight, based on the weight of the copolymer of maleic anhydride; wherein the rubber is selected from the group consisting of polyepichlorohydrin rubbers, polychloroprene rubbers, chlorinated polyethylene rubbers and ethylene vinyl acetate rubbers; wherein the amount of rubber used is in the range of from 1 to 30 percent by weight based on the weight of the styrene-maleic anhydride copolymers; with the proviso that when using an ethylene

vinyl acetate rubber the maleic anhydride content of the polymer is at least 10 percent by weight;

B. from 7.5 to 15 percent by weight, based on the total weight of the composition, of an aromatic bromine compound which will provide at least 6 percent by weight of bromine to the composition;

C. from 3 to 12 percent by weight, based on the total weight of the composition, of a metal oxide selected from the group consisting of Sb_2O_3, Bi_2O_3, MoO_3, SnO_2 and WO_3; and

D. from 3 to 25 percent by weight, based on the total weight of the composition, of a smoke suppressant selected from the group consisting of dawsonite, magnesium carbonate, alumina trihydrate, calcium carbonate, magnesium borate and mixtures thereof.

4,151,219

VINYL ESTER RESINS CONTAINING POLYOXYALKYLENE LOW PROFILE ADDITIVES

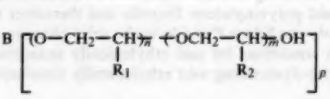
James L. Brewbaker, Midland, and William A. Sprenger, Coleman, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 795,977, May 11, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 899,921

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—836 **3 Claims**

1. A thermosettable composition comprising a mixture of (a) a terminally unsaturated vinyl ester resin comprising the reaction product of an unsaturated monocarboxylic acid with a polyepoxide, (b) at least one vinyl monomer copolymerizable therewith; and (c) a polyoxyalkylene low profile additive having the formula:



wherein R_1 and R_2 are hydrogen, methyl or ethyl with the provision that when either is hydrogen the other must be methyl or ethyl; B is the residue of a hydroxyl containing initiating compound with the value of p equal to or less than the number of hydroxyls in the initiating compound, and m and n are whole numbers such that said additive is soluble in said vinyl ester resin when uncured and insoluble in the cured resin.

4,151,220

POWDER COATING COMPOSITION

Yoshihide Watanabe; Keiji Kitada; Osamu Kuratani, and Makoto Iriuchijima, all of Saitama, Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Feb. 17, 1977, Ser. No. 769,824

Int. Cl.[2] C08L *61/24, 61/28, 75/06, 67/02*

U.S. Cl. 260—850 **24 Claims**

1. A powder coating composition which contains a vehicle comprising

(a) about 50 to about 98% by weight of a polycondensate having a softening point of about 80° to about 150° C. obtained from (i) a polyol component comprising at least about 30 mole % of 2-methylbutane-1,3-diol, and (ii) a polycarboxylic acid component comprising at least about 50 mole % of terephthalic acid and/or dimethyl terephthalate, and

(b) about 2 to about 50% by weight of a crosslinking agent selected from the group consisting of an amino resin, a blocked polyisocyanate or mixtures thereof.

4,151,221

POLY-2-PYRROLIDONE COMPOSITION HAVING IMPROVED STABILITY AND METHOD OF EXTRUDING

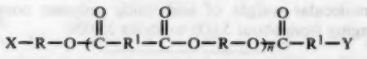
Robert Bacskai, Kensington, and Phillip H. Parker, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 8, 1978, Ser. No. 875,979

Int. Cl.[2] C08L *77/00*

U.S. Cl. 260—857 PE **8 Claims**

1. A composition comprising a major amount of normally solid poly-2-pyrrolidone and an amount of polyester, effective to reduce the thermal degradation of said poly-2-pyrrolidone to monomer, in the range of 0.1 to 0.8% by weight, based on the poly-2-pyrrolidone, and wherein said polyester is selected from the group having the formula:



wherein R and R^1 are independently selected from the group consisting of alkyl, having 1 through 20 carbon atoms; cycloalkyl having 3 through 8 carbon atoms and aryl having 6 through 12 carbon atoms; X and Y are independently —OH or —COOH; and n is a whole integer of from 4 to 150.

4,151,222

AMINE TERMINATED POLYMERS AND THE FORMATION OF BLOCK COPOLYMERS

William L. Hergenrother; Richard A. Schwarz; Richard J. Ambrose, all of Akron, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 574,676, May 5, 1975, Pat. No. 4,070,344. This application Nov. 7, 1977, Ser. No. 848,962

Int. Cl.[2] C08L *79/08*

U.S. Cl. 260—857 G **16 Claims**

1. An imide block copolymer composition, comprising:

an amine terminated polymer connected to an imide polymer constituent to form the imide block copolymer;

said amine terminated polymer being an end capped polymer formed by the reaction of an anionically prepared polymer and a single polyisocyanate or polyisothiocyanate compound so that at least one unreacted isocyanate or isothiocyanate end portion has been converted to an amine group;

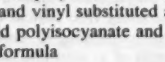
said anionically prepared polymer being a homopolymer or a copolymer, said homopolymer made from monomers selected from the class consisting of conjugated diene, vinyl substituted aromatic, vinyl substituted pyridine, vinyl substituted quinoline, and a compound selected from the class consisting of

1. $CH_2{=}CACN$ wherein A is CN, CF_3,, CH_3 or H;
2. $CH_2{=}CACO_2R$ wherein A is CO_2R, SO_2R, CH_3 or H;
3. $CH_2{=}CANO_2$ wherein A is Cl, CH_3 or H;
4. $CH_2{=}CACON(R)_2$ wherein A is CH_3 or H;

wherein R is a 1 to 15 carbon atom alkyl, a 4 to 15 carbon atom cycloalkyl, an aryl, a 1 to 15 carbon atom alkyl substituted aryl, a 4 to 15 carbon atom cycloalkyl substituted aromatic, or hydrogen;

said copolymer made from monomers of conjugated dienes and vinyl substituted aromatics;

said polyisocyanate and said polyisothiocyanate having the formula



wherein R is an aliphatic containing from 2 to about 20 carbon atoms, a cycloaliphatic containing from 4 to about 20 carbon atoms, an aromatic containing from 6 to about 20 carbon atoms, and combinations thereof, n is an integer of 2 or 3 and X is selected from the class consisting of oxygen and sulfur;

the molecular weight of said amine terminated polymer ranging from about 3,000 to about 100,000,

said imide constituent being the reaction product of a diamine and a dianhydride, said diamine selected from the class consisting of an alkyl diamine having from 2 to about 20 carbon atoms, a cycloalkyl diamine having from 4 to 20 carbon atoms, an aromatic diamine having from 6 to about 20 carbon atoms, and an alkyl substituted aromatic diamine having from 7 to about 20 carbon atoms;

said dianhydride selected from the class consisiting of an alkyl dianhydride having from 8 to 30 carbon atoms, an aromatic dianhydride having from 10 to 40 carbon atoms, and an alkyl substituted aromatic dianhydride having from 11 to 40 carbon atoms;

the amount of said imide polymer constituent ranging from about 10 percent to about 75 percent by weight based upon the total weight of said block copolymer; and

the molecular weight of said imide polymer constituent ranging from about 5,000 to about 35,000.

4,151,223
FLAME-RETARDANT FIBERS AND FILAMENTS OF LINEAR THERMOPLASTIC POLYESTERS CONTAINING HALOGENATED OLIGOMER OF STYRENE

Rainer Neuberg, Dannstadt-Schauernheim; Klaus Penzien, Frankenthal, and Hans G. Matthies, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1977, Ser. No. 833,062

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645711

Int. Cl.[2] C08G *39/02*

U.S. Cl. 260—873 **5 Claims**

1. Fibers of filaments for textile uses, comprising linear, thermoplastic polyester which contains, as a flame-proofing agent, a chlorinated and/or brominated oligomer of styrene with a degree of polymerization of 3 to 20 and a synergistic agent therefor.

4,151,224
BLENDS OF ACRYLONITRILE COPOLYMERS WITH GRAFT COPOLYMERS CONTAINING RUBBER AND ACRYLONITRILE COPOLYMER

Brian N. Hendy, Knebworth; Carl F. Mathews; Eric Nield, both of Ware; John B. Rose, St. Albans, and Peter I. Vincent, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, Great Britain

Continuation of Ser. No. 107,563, Jan. 18, 1971, abandoned, which is a continuation of Ser. No. 755,801, Aug. 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 622,904, Mar. 14, 1967, abandoned. This application Apr. 30, 1975, Ser. No. 573,329

Claims priority, application United Kingdom, Mar. 24, 1966, 13071/66; Sep. 20, 1967, 42899/67

Int. Cl.[2] C08L *51/04*

U.S. Cl. 260—876 R **16 Claims**

1. A blend comprising (A) a graft copolymer consisting essentially of up to 95% by weight of a substrate of a diene rubber containing from 40% to 100% molar of units from at least one conjugated 1,3 diene monomer and from 0 to 60% molar of units from at least one other ethylenically unsaturated monomer copolymerizable therewith using free radical catalysts, and a homogeneous superstrate consisting of units of acrylonitrile, randomly distributed units of at least one monovinylidene aromatic compound, the molar ratio of units of acrylonitrile to units of said monovinylidene aromatic compound in the superstrate being between 2 and 9 and 0 to 5% molar of ethylenically unsaturated monomer copolymerizable with acrylonitrile and said monovinylidene aromatic compound using free radical catalysts, said graft copolymer being the product obtained by forming a mixture of said rubber, a portion of said monovinylidene aromatic compound and at least a portion of said acrylonitrile and said ethylenically unsaturated monomer, polymerizing said mixture and adding quantities of ε monomeric feed selected from the group consisting of said monovinylidene aromatic compound and mixtures of said monovinylidene aromatic compound with any of said acrylonitrile and said ethylenically unsaturated monomer not present in said mixture, said monomeric feed being added to said mixture at a rate determined by the rate of polymer formation and such that the relative concentration of said monovinylidene aromatic compound and acrylonitrile in the reaction mixture remains at about the initial level and (B) a resin which comprises a homogeneous copolymer containing units of acrylonitrile and units of monovinylidene aromatic compound, the molar ratio of units of acrylonitrile to units of monovinylidene aromatic compound in the said resin being between 2 and 9, and the amount of rubber in the blend being within the range 1 to 50% by weight.

4,151,225
METHOD FOR THE MODIFICATION OF POLYVINYLIDENE FLUORIDE

Robert Blining, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 753,153

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559260

Int. Cl.[2] C08F *259/08*

U.S. Cl. 260—878 R **7 Claims**

1. A process for preparing a graft polymer of polyvinylidene fluoride wherein the polyvinylidene fluoride has grafted thereon a polymer of an ethylenically unsaturated compound which comprises contacting in the solid phase polyvinylidene fluoride with a monomer of an ethylenically unsaturated compound and diffusing said monomer and a radical forming catalyst into said polyvinylidene fluoride and thereafter maintaining said polyvinylidene fluoride in the solid phase under polymerization conditions for said ethylenically unsaturated compound and polymerizing said ethylenically unsaturated compound.

4,151,226
PROCESS FOR PRODUCING THERMOPLASTIC RESIN HIGHLY RESISTANT TO IMPACT AND WEATHER

Takashi Morinaga, Hitachi; Yasuyuki Okano, Ichihara; Koichi Kakefuda, and Kiyoyuki Suzue, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Nov. 7, 1972, Ser. No. 304,341

Claims priority, application Japan, Nov. 17, 1971, 46/91516

Int. Cl.[2] C08L *33/00*

U.S. Cl. 260—881 **24 Claims**

1. A process for producing a thermoplastic resin having high impact and weather resistance and having good rigidity and good moldability, said process comprising forming a latex (A) by polymerizing (I) 0.1 to 10% by weight of a polyalkyl compound, (II) 60 to 99.9% by weight of at least one alkyl acylate having 1 to 13 carbon atoms in the alkyl group, and (III) 0 to 30% by weight of at least one vinyl or vinylidene compound copolymerizable with (II) to obtain said copolymer latex (A), and graft copolymerizing 10 to 40% by weight of a copolymer latex (A) based on the solids content of copolymer latex (A) and 90 to 60% parts by weight of a monomer mixture (B) comprising 30 to 100% by weight of an aromatic vinyl monomer and 0 to 70% by weight of acrylonitrile plus methyl methacrylate in which the proportion of acrylonitrile is 20 to 100% by weight and the proportion of methyl methacrylate is 0 to 80% by weight, graft copolymerization being accomplished in the presence of a water-soluble polymer and a radical polymerization initiator, the polymerization system being subjected prior to graft copolymerization to a mechanical treatment for causing swelling of the latex particles of copolymer latex (A) with monomer mixture (B).

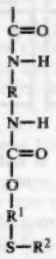
4,151,227

ACRYLIC GRAFT COPOLYMERS AND COATING COMPOSITIONS THEREOF

John A. Simms, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1977, Ser. No. 820,879
Int. Cl.[2] C08L 31/02
U.S. Cl. 260—885 8 Claims

1. A graft copolymer consisting essentially of about 25–95% by weight of an acrylate polymer backbone and about 5–75% by weight of side chains; wherein the acrylic polymer backbone contains pendent hydroxyl groups before the attachment of side chains by replacement of a hydrogen of at least one of the hydroxyl groups by the formula



where R is an aliphatic group, a cycloaliphatic group or an aromatic group; R^1 is an alkylene group having 2–6 carbon atoms, R^2, which forms a side chain, is a polymer segment of an acrylate polymer.

4,151,228

ACRYLONITRILE POLYMER BLENDED WITH A STATISTICAL COPOLYMER OF ACRYLIC ACID ALKYL ESTER AND STYRENE

Christian Lindner, Cologne; Siegfried Korte; Aziz El Sayed, both of Leverkusen, and Carlhans Suling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,392
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608878
Int. Cl.[2] C08L 33/00
U.S. Cl. 260—898 4 Claims

1. A thermoplastic moulding composition with improved flow properties, comprising a mixture of

(A) 90 to 99.9% by weight of a homopolymer or copolymer with a K-value of from 50 to 80, as measured at a temperature of 25° C. in dimethyl formamide as a 0.5% by weight solution, which contains at least 50% by weight of acrylonitrile or methacrylonitrile or mixtures thereof in polymerised form, and

(B) 0.1 to 10% by weight of a statistical copolymer of copolymerised units of 65 to 85% by weight of at least one acrylic acid alkyl ester with 1 to 8 carbon atoms in the alcohol component, and 15 to 35% by weight of styrene, copolymer B having an intrinsic vicosity [η] of from 2.9 to 13.0 dl/g, as measured at 25° C. in tetrahydrofuran.

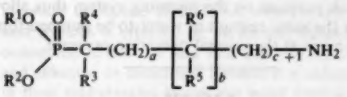
4,151,229

PROCESS FOR THE MANUFACTURE OF AMINOALKYL-PHOSPONIC ACID ESTERS

Helmut Zondler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 415,601, Nov. 14, 1973, abandoned. This application May 2, 1975, Ser. No. 574,196
Int. Cl.[2] C07F 9/38
U.S. Cl. 260—968 8 Claims

1. Process for the manufacture of aminoalkylphosphonic acid esters of the general formula I



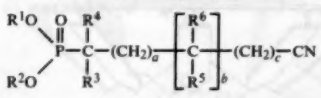
(I)

in which

R^1 and R^2 are identical or different and denote an unbranched or branched alkyl radical with 2 to 10 carbon atoms, a cycloaliphatic radical or, together, an alkyl-substituted or unsubstituted propylene radical, a, b and c are identical or different and a and c denote a number from 0 to 5 and b denotes 0 or 1,

R^3 represents hydrogen, an alkyl radical with 1 to 10 carbon atoms, phenyl or furyl and

R^4, R^5 and R^6 are identical or different and denote hydrogen or the methyl group, characterised in that a cyanoalkylphosphonic acid ester of the general formula II



(II)

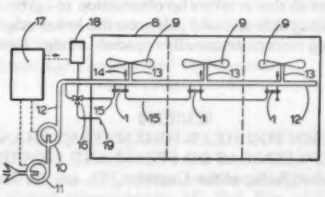
is hydrogenated catalytically using a nickel catalyst at temperatures of about 20° to 150° C. and the resulting product is freed in a known manner from the catalyst and solvents and is optionally distilled, preferably in a high vacuum.

4,151,230

VALVES FOR USE IN A COOLING TOWER INSTALLATION

Edward B. Talbot, London, England, assignor to Ruckluft Patent AG., Lucerne, Switzerland

Filed Dec. 12, 1977, Ser. No. 860,023
Claims priority, application United Kingdom, Jan. 25, 1977, 3045/77
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—25 2 Claims



1. A cooling installation comprising one or more fans each operated by a water turbine, which turbine is actuated by water flowing through a feed pipe located in parallel with a pipeline in which there is incorporated one or more combination flow and control valves, each of which comprises two symmetrical compartments separated by a flexible diaphragm, each compartment being defined by an arcuate wall having a single inlet and a single outlet located therein to allow the flow of liquid into and through the compartment, the said inlet and

outlet being interchangeable, the flexible diaphragm being mounted between the arcuate walls and being adapted to be distended into one of the compartments to reduce or restrict the flow of liquid therethrough by excess pressure exerted by liquid in the other compartment, the number of valves being the same as or a multiple of the number of fans, and the valve or each of the valves being associated with a fan, each of the valves being mounted in series and/or in parallel with each other in the pipeline, the said valve or valves being adapted to be regulated by the pressure of the water entering the installation in such a manner that when the water pressure to the installation is reduced then the valve or valves open and reduce the back pressure on the pumping system thus allowing substantially the same amount of water to be pumped through the installation as at the normal operating pressure.

4,151,231
ROTARY SURFACE AERATORS

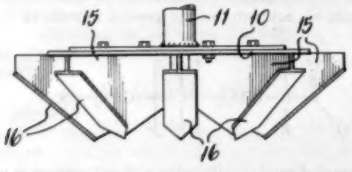
Eric P. Austin, Sandbach, and William S. Robertson, Stone, both of England, assignors to Simon-Hartley Limited, Staffordshire, England

Continuation of Ser. No. 744,439, Nov. 23, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,673

Claims priority, application United Kingdom, Jan. 10, 1976, 927/76

Int. Cl.² B01F *3/04*

U.S. Cl. 261—91 **12 Claims**



1. A rotary aerator of the type which achieves a gas liquid interface between air and the liquid by causing air to flow downwardly into the liquid along trailing blade surfaces comprising a support member in the form of a flat plate which is adapted, when the aerator is in use, to lie in a horizontal plane and to be rotated about its central vertical axis, a plurality of angularly spaced flat blades secured to the underside of said plate and each extending radially from a central region thereof towards its periphery, each said blade having a maximum depth beneath a horizontal datum at a position intermediate its ends, and being provided with a plate secured to its lower edge and extending on both sides of the blade along at least a portion of that part of the length of the blade between its outer end and the position of maximum depth, the upper edge of each blade extending freely outwardly beyond the outer periphery of the support plate so that it offers no obstruction to egress of liquid from its leading side and said plates on the lower edges of said blades being circumferentially spaced along their entire lengths.

4,151,232
COLUMN FOR HEAT- AND MASS EXCHANGE BETWEEN GAS OR STEAM AND LIQUID

Ivan P. Slobodyanik, ulitsa Gagarina, 87, kv. 15, Krasnodar, U.S.S.R.

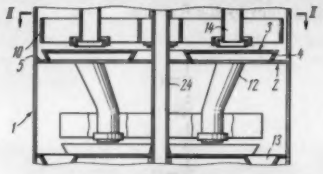
Filed Jun. 10, 1977, Ser. No. 805,463

Claims priority, application U.S.S.R., Dec. 10, 1976, 2428176

Int. Cl.² B01F *3/04*

U.S. Cl. 261—114 R **19 Claims**

1. A column for heat-and mass-exchange between gas or steam and liquid comprising: a casing; contact plates mounted in said casing in superposed relation to one another, each of said contact plates having a plurality of sections respectively in the form of individual portions of each contact plate which are raised above the remaining surface thereof and which are at least partly spaced from each other to define beyond said sections an intersection space at said remaining surface of each plate, the sections being arranged in plan in such a manner that central portions of the sections of an upper contact plate are offset with respect to central portions of the sections of a lower contact plate and are located substantially over the intersection space of a lower contact plate, said sections having solid central portions, and the remaining surface of the sections being provided with apertures for the passage of gas or steam; overflow pipes for overflow of liquid from upper contact plates to the sections of lower contact plates, said overflow pipes having



upper inlet openings located at and communicating with the intersection spaces of upper contact plates and lower outlet openings located respectively over said solid central portions of the sections of lower contact plates; arched apron plates forming part of each section and situated over said apertures thereof for directing jets of gas or steam leaving the apertures tangentially to the center of the section and in the same direction at any one section but in opposite directions at adjacent sections, respectively, so that the rotary motion of two-phase gas and liquid flows in the adjacent sections of each contact plate occur in opposite directions.

4,151,233
METHOD FOR PREPARING A SMOKE AGENT

Raymond R. Fry, Jr., Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1977, Ser. No. 843,390

Int. Cl.² C06B *21/00, 39/00*

U.S. Cl. 264—3 B **12 Claims**

1. A method for preparing a red phosphorous smoke agent wherein particulate red phosphorous is coated with a polymer consisting essentially of the step of mixing particulate red phosphorous with a non-swollen rubber latex selected from the group consisting of natural and synthetic rubber latex.

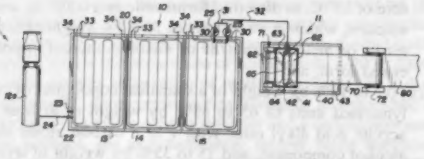
4,151,234
PROCESS FOR PREPARATION OF SULFUR NUGGETS FOR STORAGE AND TRANSPORTATION

James W. Schofield, Brownsville, Tex., assignor to Liquid Terminals, Inc., Brownsville, Tex.

Continuation-in-part of Ser. No. 674,051, Apr. 5, 1976, abandoned, and a continuation-in-part of Ser. No. 595,898, Jul. 15, 1975, abandoned. This application May 3, 1977, Ser. No. 793,417

Int. Cl.² B01J *2/06*

U.S. Cl. 264—13 **14 Claims**



1. A process for producing solid nuggets of sulfur having irregular shapes and sizes, comprising:

(a) flowing molten sulfur at a temperature in the range of about 240°–270° F. to a distributor head having discharge opening means;
(b) discharging said molten sulfur from said distributor head through said opening means into a cooling liquid in a continuous ribbon-shaped stream having a width substantially greater than the thickness thereof;
(c) retaining said sulfur stream in said ribbon-shape until said stream enters said cooling liquid;
(d) passing said sulfur stream through said cooling liquid while maintaining the temperature of said cooling liquid in the range of about 170°–190° F. until said sulfur stream is subdivided and cooled to a solidified condition as nuggets of irregular shape and size having a moisture content not exceeding about 1%; and
(e) removing said nuggets from said cooling liquid.

4,151,235
PRODUCTION OF BETA-ALUMINA

Geoffrey J. May, Frodsham, and Stephen R. Tan, Runcorn, both of England, assignors to Chloride Silent Power Limited, London, England

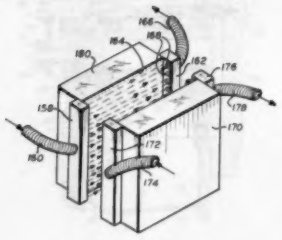
Filed Aug. 4, 1977, Ser. No. 822,015
Claims priority, application United Kingdom, Aug. 16, 1976, 34004/76
Int. Cl.² C04B *35/10*
U.S. Cl. 264—13 **13 Claims**

1. A method of producing a beta-alumina ceramic article from a precursor material containing a doping addition of magnesium oxide or of magnesium oxide and lithium oxide, comprising the steps of spray-drying an aqueous slurry of the precursor material to produce a powder, forming the powder into a green shape and sintering the shape, and wherein the precursor material contains at least some of the magnesium oxide in the form of magnesium aluminate.

4,151,236
METHOD FOR MOLDING MATERIALS

Leonard B. Ryder, 5 Sharon Dr., Whippany, N.J. 07981

Continuation in part of Ser. No. 628,670, Nov. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 498,959, Aug. 20, 1974, Pat. No. 3,937,609. This application May 28, 1976, Ser. No. 691,091
Int. Cl.² B28B *7/04*
U.S. Cl. 264—39 **1 Claim**

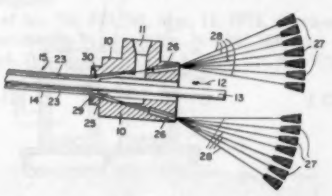


1. In a method for molding a plastic article wherein the condensation of moisture from ambient humid air is minimized upon the face of mold sections which have been cooled, prior to molding, to a temperature below the dew point of said humid air, comprising:
(a) positioning opposite each other in a spaced apart relationship cooled first and second mold sections each having a mold face,
(b) moving said first and second mold sections toward each other to enclose a mass of heated plastic material which is introduced between said mold faces,
(c) forming said heated plastic material against said opposed mold faces to shape said plastic material thereto,
(d) cooling said plastic material by contact with said cooled mold sections,
(e) moving said first and second mold sections apart,
(f) removing said molded plastic article,
the improvement comprising, whenever said mold sections are in a spaced apart relationship,
directing continuously across the face of each of said first and said second cooled mold sections separate streams of dehumidified gas in a direction perpendicular to the direction of movement of said mold sections to form first and second curtains respectively of said gas immediately adjacent the face of each of said first and second mold sections to inhibit said humid air from contacting said cooled mold section faces and to thereby minimize the condensation of moisture upon said mold faces, wherein the directing of said streams is effected by an emitter means operatively connected to each of said first and second mold sections and effective to direct said streams at a velocity sufficient to flow said streams across the mold section faces and a receiver means operatively connected to each of said mold sections and effective to receive said gas streams being directed from said emitter means.

4,151,237
PRODUCTION OF CABLES WITH UNDULATED TENSION RELIEF ELEMENTS

Robert Ney, Langerwehe, Fed. Rep. of Germany, assignor to Lynenwerk GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,238
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702185
Int. Cl.² B29F *3/10*; H01B *7/18*
U.S. Cl. 264—40.7 **6 Claims**



1. In the production of electric cable in a cable extruder head wherein a cable core, a jacketing material and tension relief strands are fed into the extruder head to produce a tubular jacket for the core having the tension relief strands embedded in the jacket material, an improved method for providing undulations in said tension relief strands, comprising:
forming said undulations by introducing the tension relief strands and the jacketing material into the extruder head at a velocity greater than the velocity of the cable core and thereafter reducing the velocity of the jacketing material having the tension relief strands therein to effect compression and produce said undulations.

4,151,238
FOAM INSULATED CONDUCTOR

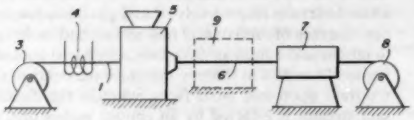
Gerhard Ziemek, Langenhagen, and Bernd Eilhardt, Hannover, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutenhoffnungshuette AG, Fed. Rep. of Germany

Filed Feb. 23, 1977, Ser. No. 771,087
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607362
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.5 **6 Claims**

1. A process for producing a foam insulated conductor, comprising:
heating a conductor to a temperature of over 200° C. at which the conductor retains sufficient heat to effect heating of a subsequently applied polymer composition to a

temperature at which crosslinking and foaming of the polymer is effected:

applying to the conductor in an extruder a polymer composition containing a polymer to be foamed and crosslinked, crosslinking agent and foaming agent, said polymer composition being applied in an uncrosslinked and unfoamed form; and



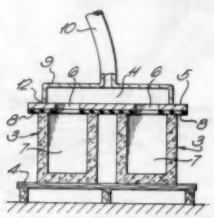
subsequent to the application, heating the polymer composition on the conductor by the heat content of the conductor to a temperature at which the polymer is crosslinked and foamed to produce a crosslinked, foamed insulated conductor.

4,151,239

IMPROVEMENTS IN AND RELATING TO BUILDING BLOCKS

Dennis H. Ogden, Wolverhampton, England, assignor to British Industrial Plastics Limited, Manchester, England

Filed Oct. 11, 1977, Ser. No. 841,588
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—46.6 **8 Claims**



1. A method of producing a building block having a cavity filled with a cured aminoplast resin foam, the method including the steps of forming a curable foam from an aqueous solution of a urea-formaldehyde resin solution and a curing agent for the resin, bringing the cavity to be filled into sealing engagement with a cover or shoe-like discharge outlet at the end of a delivery pipe for the foam, and injecting the foam into the cavity until a back pressure is developed in the delivery pipe, said back pressure being sufficient only to force some of said foam into the material of said block, whereby the foam is retained therein.

4,151,240

METHOD FOR DEBOSSING AND PERFORATING A RUNNING RIBBON OF THERMOPLASTIC FILM

Malcolm B. Lucas, and Robert H. Van Coney, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 19, 1976, Ser. No. 733,961
Int. Cl.[2] B29C *17/04*
U.S. Cl. 264—504 **4 Claims**

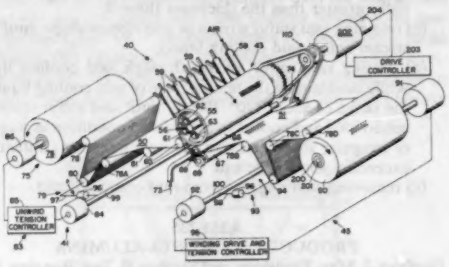
1. A method of continuously debossing and perforating a running ribbon of smooth thermoplastic film which method comprises the steps of:

establishing and maintaining control of said film by establishing and maintaining constant tension therein;

isolating a portion of said film from said constant tension while it is in contacting relation with a perforated pattern surface;

heating the tension isolated portion of said film to raise its temperature to above its thermoplastic temperature;

applying a sufficiently great first pneumatic differential



pressure to the heated, tension isolated portion of said film to cause said film to be debossed and perforated in the image of the perforated pattern surface; and,

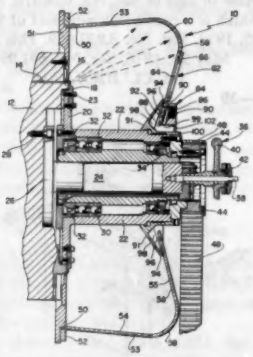
cooling the debossed and perforated film to lower its temperature to below the thermoplastic temperature of the film before subjecting said film to downstream tension.

4,151,241

METHOD OF COOLING PELLETS

Christopher G. Bradbury, Rumford, R.I.; Walter Buchan, Norton; Gomer E. Kropa, North Reading, both of Mass., and Edward J. Winiarski, Pawtucket, R.I., assignors to Leesona Corporation, Warwick, R.I.

Division of Ser. No. 748,235, Dec. 6, 1976, Pat. No. 4,099,900.
This application May 22, 1978, Ser. No. 909,213
Int. Cl.[2] B29C *17/14*
U.S. Cl. 264—142 **7 Claims**



1. In a method of forming discrete thermoplastic resin pellets by extruding, the improvement comprising directing said discrete thermoplastic resin pellets, at least portions of which are in a hot, sticky condition, radially outwardly and forwardly into initial contact with internal side or forward surfaces of an enclosing chamber, directing a first coolant flow over and in contact with a major portion of said side surface while simultaneously directing a second coolant flow radially outwardly over and in contact with a major portion of said forward surface to entrain said pellets upon initial contact with said chamber in one of said coolant flows, cooling said pellets and thereafter removing substantially all of said pellets from said chamber in less than a single pass peripheral orbit about said side surfaces.

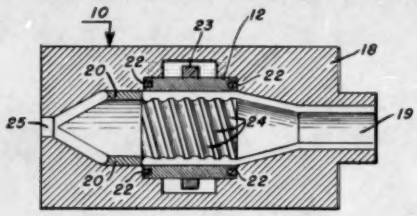
4,151,242
METHOD FOR EXTRUDING PLASTICS

Leonard F. Sansone, Andover, N.J., assignor to Sussex Plastics Engineering Inc., Andover, N.J.

Division of Ser. No. 664,905, Mar. 8, 1976, Pat. No. 4,076,481, which is a continuation-in-part of Ser. No. 541,198, Jan. 15, 1975, abandoned. This application Oct. 27, 1977, Ser. No. 846,108

Int. Cl.[2] B29F *3/00, 3/04, 3/08*

U.S. Cl. 264—177 R 2 Claims



1. In a method of forming smooth uniform annular extrusions of plastic material in which molten plastic material is continuously passed from an extruder screw under pressure through the annulus formed between an inner mandrel member and a surrounding outer die member, the inner mandrel and the outer die member both being maintained stationary at the die outlet, the improvement which comprises continuously shearing the molten plastic in a shear zone upstream of the die outlet and downstream of the extruder screw in a direction transverse to the direction of flow of molten plastic through said shear zone while simultaneously continuously pumping said molten plastic through said shear zone independently of said extruder screw, said shearing being operable to increase the temperature of the molten plastic as it passes through said shear zone and said pumping being operable to increase the pressure of said molten plastic as it passes through said shear zone and to decrease the pressure in said extruder,

said shearing and pumping being accomplished by passing said molten plastic through the annulus between a hollow shear ring mounted in said outer die member and said inner mandrel member while rotating said ring relative said mandrel.

4,151,243
METHOD FOR COOLING PLASTIC INJECTION MOLD DIES

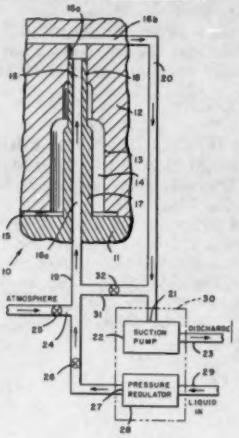
Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Sandy Hook, Conn.

Filed Apr. 3, 1978, Ser. No. 892,592

Int. Cl.[2] B29F *1/08*

U.S. Cl. 264—219 7 Claims

1. A method of cooling a plastic injection mold having a stationary die and a movable die defining a mold cavity comprising the steps of forming a portion of a cooling passageway in one die, forming a portion of the cooling passageway in the other die, closing the dies to cause communication between the two portions, applying a less than atmospheric pressure to one end of the passageway to induce flow of fluid through the



passageway and permitting cooling liquid to flow into the other end of the passageway only when the dies are closed.

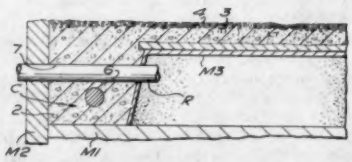
4,151,244
METHOD OF MANUFACTURING PRE-CAST CONCRETE PANELS

Edward B. Small, Cleavesty Lodge, East Keswick, near Leeds, Yorkshire, England

Continuation of Ser. No. 557,769, Mar. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 387,368, Aug. 10, 1973, abandoned. This application Jun. 1, 1976, Ser. No. 691,249

Int. Cl.[2] B28B *23/04*

U.S. Cl. 264—228 1 Claim



1. A method of manufacturing a pre-cast concrete panel having a thin concrete skin overlying a reinforcing hardboard sheet whose edges are embedded in a concrete frame that is integral with the skin and extends around the periphery of the sheet, comprising the steps of

(1) soaking in water a hardboard sheet of the type that is pervious to water and shrinks as it dries at a rate substantially equal to the shrinkage rate of the wet concrete skin for an appreciable period of time and to which the concrete skin adheres as it dries and which hardboard sheet continues to shrink thereafter and prestress the adherent concrete skin,

(2) supporting the water soaked sheet in a mold so that the upper face of the sheet is substantially horizontal, the mold having a cavity extending around the periphery of the sheet for forming the concrete frame and the edges of the sheet extending over the cavity,

(3) filling the peripherally extending cavity of the mold with concrete to embed the edge regions of the sheet and form a frame around the sheet having a thickness substantially greater than the thickness of the concrete skin,

(4) convering the upper face of the sheet with a thin skin or

concrete while the sheet is still wet whereby the concrete skin and hardboard sheet shrink at substantially equal rates for an appreciable period of time as they dry and the skin adheres to the hardboard sheet, and

(5) removing the concrete panel with its embedded sheet from the mold after the concrete has set sufficiently to retain its shape without the assistance of the mold.

4,151,245

METHOD FOR STRETCHING A THERMO-SOFTENING HIGH MOLECULAR FILM

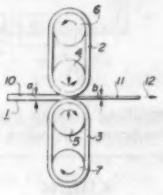
Takashi Suzuki, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 619,247, Oct. 3, 1975, abandoned, which is a continuation of Ser. No. 421,058, Dec. 3, 1973, abandoned. This application Oct. 3, 1977, Ser. No. 838,842

Claims priority, application Japan, Dec. 6, 1972, 47-122741; Oct. 26, 1973, 48-120884

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—288 **2 Claims**



1. A method of stretching a film which is a thermo-softening high molecular film in a stretching operation consisting essentially of the steps of

maintaining said film at a temperature below its softening temperature,

moving said film in a longitudinal direction between first and second rubber belts trained around first and second metallic pulleys respectively having their axes of rotation perpendicular to said longitudinal direction, and

applying pressure to said film by means of said pulleys through said rubber belts while gripping said film between said belts, said pressure being applied only between said first and second metallic pulleys and being sufficient to exert on the surface of said film a force perpendicular to the surface of said film which expands the film while at the same time exerting a compressive force therein in the direction of its thickness, thereby to stretch said film substantially unidirectionally in a longitudinal direction, wherein the rubber belts have a hardness less than that of said film, a thickness of ten to one thousand times that of said film, a width greater than that of said film before stretching, and the thickness of the rubber belts is reduced to about 50 to 85 percent of their original thickness during said pressure applying step.

4,151,246

MANUFACTURE OF SHORT PIPES

Dudley R. Lester, Constantia, and Leslie D. Reeves, Pineland, both of South Africa, assignors to Vianini Pipes (Proprietary) Limited, Randburg, South Africa

Filed May 9, 1977, Ser. No. 795,236

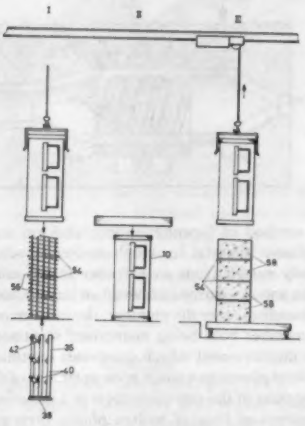
Claims priority, application South Africa, May 14, 1976, 76/2893

Int. Cl.[2] B28B *1/10*

U.S. Cl. 264—297 **4 Claims**

1. A method of moulding short lengths of pipe in a vertical pipe-making machine, which consists in locating in a cylindrical mould a series of rings, co-axial with the mould, that divide the length of the mould into several compartments; projecting sets of stops through the wall of the mould and into the moulding space before moulding the pipe, one set in respect of each ring; engaging the stops with the rings to locate the rings in the mould, filling the compartments of the mould with settable material; causing or allowing the material to set to form a pipe with the rings embedded in it and extending from the inner to the outer surface of the pipe, retracting the stops and dividing the pipe into lengths by removing the rings from it.

4. A method of moulding short lengths of pipe in a vertical pipe-making machine, which consists in locating a jig, then forming around the jig and about a vertical axis a cylindrical stack of several reinforcing cages separated from one another by dividing rings, the rings being aligned and supported by the



jig; then locating a cylindrical mould around the stack, with the internal surface of the mould in contact with the rings; projecting into the moulding space, through the wall of the mould, sets of stops, one set for each ring, so that the stops engage and support the rings; moving the mould and the stack relatively to the jig, to withdraw the jig from the stack; introducing settable material into the mould to form a pipe, with the rings extending through the thickness of the pipe wall; causing or allowing the material to set; retracting the stops from the moulding space; demoulding the pipe; and removing the rings to separate the pipe into lengths.

4,151,247

INJECTION BLOW MOLDING APPARATUS

Robert X. Hafele, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 20, 1977, Ser. No. 843,874

Int. Cl.[2] B29F *1/00*; B29C *17/07*

U.S. Cl. 264—328 **21 Claims**

21. In a process for injection blow molding hollow plastic bodies, the steps comprising:

a. positioning a hollow neck mandrel between a vertically oriented open split injection mold, one of which mold halves is fixedly positioned and the other half of which is movable horizontally;

b. simultaneously moving said movable injection mold half and said neck mandrel transversely toward said fixed injection mold half until said mold halves are closed and said neck mandrel is received at least partially within said closed mold;

c. vertically inserting a preform pin through said neck mandrel into a cavity provided within said closed injection mold;

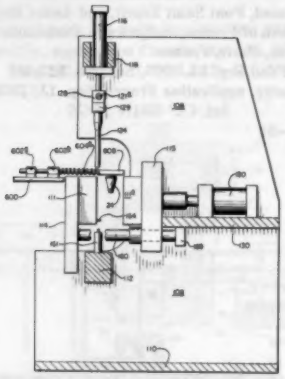
d. injecting thermoplastic material into a hollow space defined by said cavity in said injection mold, preform pin and said neck mandrel to form a plastic preform in said hollow space;

e. cooling said plastic preform to a temperature at which it will maintain its basic shape when removed from said injection mold;

f. retracting said movable injection mold half and said neck mandrel and attached plastic preform simultaneously from

said fixed mold half until said neck mandrel and plastic are clear of the front face of said fixed mold half;

g. stopping the movement of said neck mandrel and plastic preform and movable mold half until the front face of said



mold half is clear of said neck mandrel and plastic preform; and

h. horizontally moving said neck mandrel and attached plastic parison from between said open injection mold halves.

4,151,248

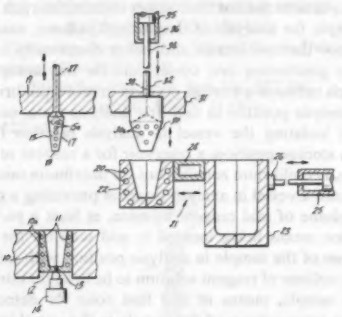
METHOD FOR THE PREPARATION OF HOLLOW PLASTIC ARTICLES

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation of Ser. No. 618,782, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application Oct. 20, 1977, Ser. No. 843,718

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—513 **21 Claims**



1. A method for the preparation of oriented hollow articles of moldable organic plastic material which comprises: providing an organic plastic parison in a formable condition at a temperature substantially above that required for orientation of said plastic on a temperature controlled first core in a temperature controlled first mold, said first core and first mold being held at temperatures substantially below that required for orientation of said plastic; altering the heat content of said parison by means of heat exchange with said first core and first mold to result substantially in the heat content of said parison having an average temperature suited for orientation, wherein said alterning is effected at temperature gradients adapted for rapid heat flow, with an unequal distribution of temperature resulting across the walls of said parison; providing a first means to retain the parison in a closed environment efficiently suitable for equalizing the temperature distribution within the walls of the parison to attain a temperature substantially corresponding to the orientation temperature of said plastic; providing a second means capable of influencing the inside temperature of said parison; transferring said parison from said first core and first mold to said second means and first means; maintaining said parison on said second means in said first means without substantially altering the heat content of said parison for a time sufficient for the portions of said parison previously in contact with said first core and first mold to substantially reach the orientation temperature of said plastic and to substantially equalize the temperature distribution of said parison; transferring said parison to a blow mold; and fully expanding the parison in said blow mold.

4,151,249

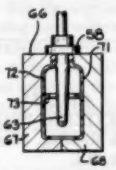
METHOD OF MAKING A BLOWN BOTTLE WITH INTERNAL RIBS

Soo-Il Lee, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 5, 1978, Ser. No. 866,979

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—520 **9 Claims**



1. A method of making a blown plastic container having at least one internal rib comprising:

a. preparing a substantially non-crystalline blowable plastic parison having a major portion and at least one strip portion such that said major portion is at a temperature within the orientation temperature range for said parison and said strip portion has a higher modulus of elasticity than said major portion; and

b. blowing the parison within a blow mold to form said container, said major portion expanding during blowing at a faster rate than said strip portion such that an interior folded rib is formed by said strip portion and adjacent areas of said major portion.

4,151,250

METHOD FOR BLOW MOLDING PLASTIC ARTICLES

James W. Barry, Guilford, Conn., and Andrew C. Dickson, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 659,621, Feb. 20, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 826,003

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—532 **5 Claims**

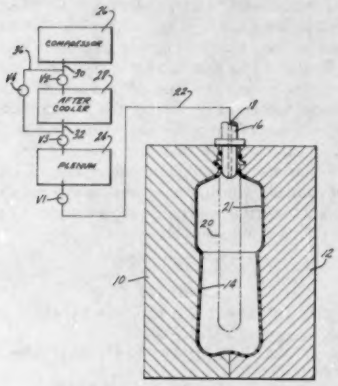
1. In a method of making a clear blown article by blow molding a blowable plastic shape consisting essentially of polyethylene terephthalate, which tends to develop a haze of stress whitening when rapidly blown at a temperature conducive to molecular orientation, the steps of:

closing the sections of a blow mold around a blowable plastic shape consisting essentially of polyethylene terephthalate;

injecting blow fluid under pressure into the blowable shape while said shape is at a temperature conducive to molecular orientation within the range of about 165° to about 200° F., the blow fluid being (a) at a pressure of between about 400 and about 500 psi and (b) at a temperature

between about 150 degrees F. and about 400 degrees F. when injected into the blowable shape prior to any adiabatic expansion, and the injecting step being performed in less than about three seconds; and

removing the blown article from the blow mold.

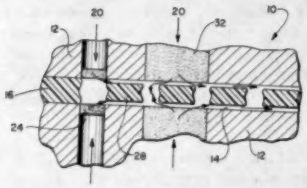


4,151,251

PELLETIZING PROCESS

Gomer E. Kropa, North Reading, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Oct. 25, 1977, Ser. No. 845,412
Int. Cl.[2] B29C *17/06*
U.S. Cl. 264—557 10 Claims



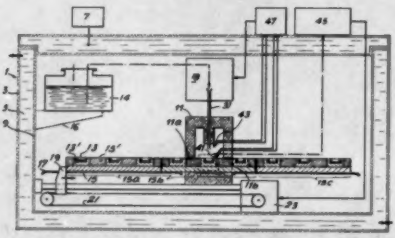
1. A method of forming thermoplastic material in discrete lengths thereof comprising heating the thermoplastic material to make it fluid, conveying such heated material to an extrusion die having at least one extrusion orifice in the form of a finite length generally closed passage of significant extent open at opposite ends to sequentially receive a fluid stream of said material under pressure at one end and exit at least partially solidified discrete lengths of said material at the other end thereof, continuously forcing said material through said orifice and outwardly from the die at said exit end thereof, intermittently directing at least a portion of a liquid coolant which is immiscible and non-reactive with said material, at a pressure sufficiently high to interrupt said fluid stream generally transversely into said orifice at a point remote from said exit die end wherein said material remains in an essentially fluid state into said fluid stream so as to interrupt and divide said fluid stream into said discrete material lengths, and vaporizing at least part of said coolant immediately upon entrance to said orifice while simultaneously contacting at least those material end portions adjacent said interrupted stream portion so as to cool said end portions and form at least partially solidified end walls of adjacently disposed said discrete lengths of material exiting from said die.

4,151,252

DEVICE FOR THE ANALYSIS OF SAMPLES BY MEASUREMENT OF THE HEAT FLUX RELEASED AT THE TIME OF CONTACTING OF EACH SAMPLE WITH A REAGENT

Joseph Marchand, Pont Saint Esprit, and Andre Roger, Bagnols sur Ceze, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 12, 1977, Ser. No. 832,455
Claims priority, application France, Sep. 13, 1976, 76 27468
Int. Cl.[2] G01N *25/20*
U.S. Cl. 422—51 9 Claims

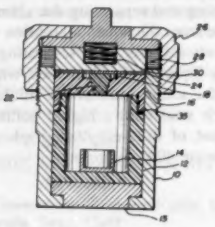


1. Apparatus for the analysis of samples by measurement of the heat flux liberated during contact of each of the samples with a reagent comprising a thermally insulated enclosure, means for regulating the temperature in said enclosure, a wall in said enclosure defining in said enclosure a first sample analysis zone within said wall, a second zone for thermal equilibrium of the samples and the reagent external of said wall in said enclosure, said wall having a high calorific capacity providing flow of the heat flux liberated in said analysis zone toward said enclosure, vessels open at their upper extremities each containing a sample for analysis of determined volume, said vessels having low thermal inertia and being electrically insulated, means for positioning said vessels and for displacing each of said vessels between a storage position in said equilibrium zone and an analysis position in said first analysis zone, said means thermally isolating the vessel in analysis position from the vessels in storage position, a reservoir for a reagent solution in said second equilibrium zone, means for distributin said reagent solution into a vessel in analysis position providing a predetermined volume of said reagent solution, at least a part of said distribution means being located in said wall for the thermal equilibrium of the sample in analysis position with said predetermined volume of reagent solution to be brought into contact with the sample, means in said first zone for detecting the respective temperatures of the sample in the vessel in analysis position and of the volume of reagent solution to be brought into contact with the sample, thermoelectric means in said first zone of low thermal inertia detecting the heat flux liberated during the contact of each of the samples with the reagent solution, means outside of said enclosure electrically connected to said detecting means for measuring the thermal equilibrium between the sample in the vessel in analysis position and the volume of reactant solution in contact therewith, means outside of said enclosure electrically connected to said thermoelectric means for measuring the heat flux liberated during the contact of each of the samples with the reagent solution, means outside of said enclosure for control of said distribution means of the reagent solution and control means outside said enclosure for controlling said means for positioning said vessels.

4,151,253
HIGH-PRECISION PRESSURE

Clinton A. Waggoner, and Murdock E. Schmitz, both of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Canada

Filed Mar. 30, 1978, Ser. No. 891,923
Claims priority, application Canada, Apr. 26, 1977, 276987
Int. Cl.[2] B01L *1/00*; G01N *31/00*
U.S. Cl. 422—68 4 Claims



1. In an apparatus for dissolving a difficultly soluble substance under pressure, said apparatus comprising an outer casing, a close-fitting reaction vessel adapted to be received within said outer casing, a first closure member for said reaction vessel, and a second closure member for said casing to prevent the first closure member from becoming unseated when the reaction vessel is pressurized,

the improvement comprising a vapor trap for collecting and retaining reactants which tend to escape from the reaction vessel upon de-pressurization of the apparatus, wherein said first closure member includes an opening, an external diaphragm member to close said opening and a pressure relief plug which when positioned in said opening, together with said diaphragm member, defines said vapor trap.

4,151,254
ADSORPTION COLUMNS FOR USE IN RADIOIMMUNOASSAYS

Arlene J. Gimovsky, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 16, 1975, Ser. No. 587,264
Int. Cl.[2] G01N *31/00*
U.S. Cl. 422—71 9 Claims

1. A process for the preparation of a disposable adsorption column useful for radioimmunoassays in a centrifugal field which process comprises the steps of:

(1) inserting into a cylindrical column which is open at both ends and has a middle portion of essentially uniform diameter, a bottom protion which tapers to a lesser diameter than said middle portion, and an upper portion which is of a greater diameter than said middle portion, a first porous hydrophilic disc-shaped retaining member comprised of polyethylene and having a porosity of up to about 30 microns and capable of: (a) retaining a separation medium within said column, (b) withstanding a centrifugal filed of at least five times gravity without cracking or bending, and (c) passing liquid at a rate faster than that of said separation medium, said first retaining member having pores sized smaller than the size particles comprising said separation medium and being disposed within said column at a point wherein said middle portion narrows to said lesser diameter;

(2) filling said middle portion of said column with an aqueous slurry of a separation medium comprised of a gel in water having a ratio of water to gel of from about 1:1.5 to about 1.5:1, said separation medium capable of selectively retaining one or more components which are admitted to said column, at least about 90 percent of the particles comprising said separation medium sized from about 20 to about 80 microns;

(3) inserting into said column a second porous hydrophilic disc-shaped retaining member comprised of polyethylene and capable of: (a) retaining said separation medium within said column, (b) withstanding a centrifugal field of at least five times gravity without cracking or bending, and (c) passing liquid at a rate faster than that of said separation medium, said second retaining member having pores sized smaller than the size particles comprising said separation medium disposed within said column at a point on top of said separation medium approximately wherein said middle portion widens to said greater diameter;

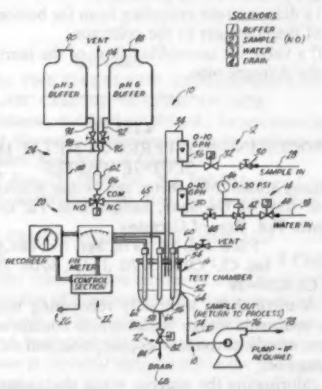
(4) admitting sufficient water to the top of said column to prevent said separation medium for drying, and

(5) attaching removeable sealing means to both ends of said column.

4,151,255
pH MONITOR WITH AUTOMATIC BUFFER STANDARDIZATION

Italo A. Capuano, Orange, and Edward G. Miller, East Haven, both of Conn.

Filed Oct. 11, 1977, Ser. No. 841,187
Int. Cl.[2] G01N *31/16, 27/30*
U.S. Cl. 422—76 19 Claims



1. An apparatus for monitoring the pH of a sample source, comprising:

a. sample feed means, for selectively withdrawing a fluid sample from said sample source and supplying said withdrawn fluid sample to said apparatus,

b. test chamber means, in fluid communication with said sample feed means, for receiving said fluid sample and containing said fluid sample during said monitoring,

c. pH measurement electrode means, for selectively measur-

ing the pH of said contained fluid sample and generating a signal output indicative of said measurement,

d. sample removal means, for removing said fluid sample from said test chamber means,

e. automatic buffer standardization means for automatically periodically standardizing said pH measuring means against a buffer solution of known pH, and

f. automatic zeroing means for automatically adjusting the signal output of said pH measurement electrode means so as to produce accurate pH readings.

4,151,256

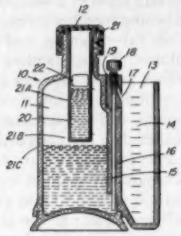
WATER-IN-OIL DETECTION DEVICE

August B. Pedersen, East Horsley, England, assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 796,107, May 12, 1977, Pat. No. 4,089,652. This application May 8, 1978, Ser. No. 904,100

Int. Cl.[2] G01N *33/18, 33/22*

U.S. Cl. 422—102 **6 Claims**



1. A testing device for detecting the presence of small quantities of water in petroleum products, which comprises:

(i) a container for an inert liquid,

(ii) a closure means for the container for providing a substantially gas-tight seal,

(iii) a sample cup for containing a predetermined quantity of the petroleum product which is to be tested and having access to the interior of the container

(iv) a collector integral with the container for receiving a quantity of the inert liquid expelled from the container by gas pressure in the container,

(v) a delivery tube extending from the bottom of the interior of the container to the collector,

(vi) a valve for controlling flow of the inert liquid through the delivery tube.

4,151,257

PROCESSING NONFERROUS METAL HYDROXIDE SLUDGE WASTES

Wolfgang Müller, Mannheim, and Lothar Witzke, Bruhl, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,446

Int. Cl.[2] C01G *3/10, 37/14, 9/06, 53/10*

U.S. Cl. 423—24 **3 Claims**

1. A method for separately recovering nonferrous metals from hydroxide sludge wastes which contain as the main nonferrous metals, chromium, copper, zinc, and nickel, comprising the steps of:

a. chlorinating the aqueous waste sludge suspension at temperatures of about 20° to 80° C. and pH values between 4 and 13, acidifying the chlorinated waste with sulfuric acid to reach a pH value from 1.0 to 3.0, separating the insoluble components therefrom to produce a solution containing Cr(VI) and treating this aqueous solution in a fixed bed anion exchanger at pH values of <3 to separate the Cr(VI) therefrom;

b. separating the copper from the aqueous solution remaining from step a) by liquid-liquid extraction at a pH from 1.5 to 2.5 using an extraction liquid selected from the group consisting of substituted hydroxybenzophenonoximes diluted with petroleum;

c. separating the zinc at a pH about 2 to 3 from the aqueous solution containing chloride and sulfate remaining from (b) by liquid-liquid extraction using as the extraction means an organophosphoric acid having the formula

$$(OR)_2POOH$$

wherein R is alkyl;

d. precipitating and separating the aluminum in the form of hydroxide from the aqueous solution remaining from step c) by filtration thereof and separating the nickel from the filtrate by liquid-liquid extraction wherein the extracting agent is the sodium salt of the diluted di-(2-ethylhexyl-)phosphoric acid with a highly boiling aromatic solvent, the amount of di-(2-ethylhexyl-)phosphoric acid in the mixture being 40% by volume.

4,151,258

DISSOLUTION OF COBALTIC HYDROXIDE WITH ORGANIC REDUCTANT

Ranko Crnojevich, Gretna; Edward I. Wiewiorowski, and Donald H. Wilkinson, both of New Orleans, all of La., assignors to Amax Inc., Greenwich, Conn.

Filed Mar. 6, 1978, Ser. No. 883,377

Int. Cl.[2] C01G *51/10*

U.S. Cl. 423—150 **13 Claims**

1. In the recovery of cobalt from nickel leach solutions wherein the cobalt is separated from said solution as a precipitate containing cobaltic hydroxide, the improved method of dissolving said precipitate for the subsequent recovery of cobalt therefrom which comprises,

forming an aqueous slurry of said precipitate acidified with sulfuric acid to a pH ranging up to about 2,

adding an amount of organic reductant sufficient to effect reduction of trivalent metal in said precipitate to the soluble divalent state, said organic reductant being one capable of being oxidized to the higher oxidation state by an oxidant at a voltage of 1.4 to 1.8 referred to the standard hydrogen electrode,

and continuing said reduction at a pH in the range of about 0.5 to 1 to effect substantial dissolution of said precipitate at a temperature ranging up to the boiling point of said aqueous slurry.

13. In the recovery of cobalt from cobalt-containing nickel solutions wherein the cobalt is separated from said solution as a precipitate containing cobaltic hydroxide and also containing nickel, the improved method of dissolving said precipitate for the subsequent recovery of cobalt therefrom which comprises,

forming an aqueous slurry of said precipitate acidified with sulfuric acid to a pH ranging from about 0.1 to 2,

adding an amount of organic reductant sufficient to effect reduction of trivalent metal in said precipitate to the soluble divalent state,

said organic reductant being one capable of being oxidized to the higher oxidation state by an oxidant at a voltage of 1.4 to 1.8 referred to the standard hydrogen electrode,

continuing said reduction to effect dissolution of said precipitate at a temperature ranging from about ambient to the boiling point of said aqueous slurry while consuming substantially all of said organic reductant,

and then completing said reduction and dissolution of said precipitate by adding an amount of a metal powder selected from the group consisting of nickel and cobalt sufficient to reduce the remainder of the contained trivalent metal to the divalent state.

4,151,259

USE OF OIL-WATER EMULSIONS IN A HYDROTHERMAL PROCESS

Clinton A. Hollingsworth, Lakeland, Fla., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 779,770, Mar. 31, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,120
Int. Cl.[2] C01F 1/00
U.S. Cl. 423—167 9 Claims

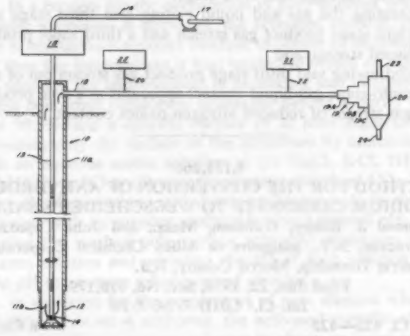
1. Process for defluorinating particulate phosphate rock feed comprising the steps of combusting an emulsion of fuel oil and water containing in excess of about 5% water to produce products of combustion, which include water vapor; contacting products of combustion with the particulate feed; and recovering a particulate product.

4,151,260

HYDROGEN SULFIDE ABATEMENT IN GEOTHERMAL STEAM

Byron B. Woertz, Claremont, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Oct. 26, 1976, Ser. No. 735,768
Int. Cl.[2] C01B 17/16, 31/20; F03G 7/02
U.S. Cl. 423—224 24 Claims



1. In a drilling operation to form a well, a process for the treatment of geothermal steam produced during the drilling operation to effect an abatement of the emission of hydrogen sulfide contained in said steam, the process comprising:

flowing said produced geothermal steam through a conduit communicating the well and the atmosphere;

injecting into said produced geothermal steam flowing through said conduit hydrogen peroxide and an alkaline material selected from the group consisting of the alkali metal hydroxides and calcium hydroxide;

maintaining said hydrogen peroxide and alkaline material in contact with said steam for a sufficient period to effect a reduction in the hydrogen sulfide content of said steam and to form environmentally harmless reaction products; and

thereafter discharging said steam and said reaction products to the atmosphere.

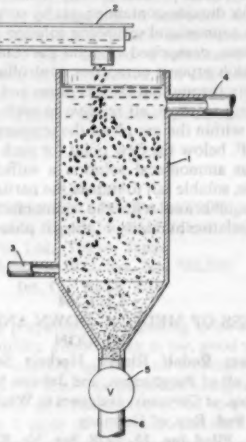
4,151,261

METHOD OF PREPARING SODIUM LIQUORS LOW IN CALCIUM

Rustom P. Poncha, and Alan B. Gancy, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 17, 1975, Ser. No. 587,579
Int. Cl.[2] C01D 7/00
U.S. Cl. 423—206 T 3 Claims

1. In the process of dissolving calcined trona to obtain aqueous sodium carbonate solution and insolubles which involves contacting the calcined trona with water or aqueous solvent lean in sodium carbonate and separating the resultant aqueous sodium carbonate solution from insolubles, the improvement which comprises: effecting the solution of the calcined trona is countercurrent flow in a vertically disposed vessel, by feeding fresh calcined trona to the top of the vessel and feeding water or aqueous solution lean in sodium carbonate at or near the bottom of the vessel, maintaining the temperature at or near the bottom of the vessel within the range of between about 40°



and 90° C. and the temperature at or near the top of the vessel within the range of between about 80° and 110° C. and the temperature in the intermediate regions between the above-mentioned temperatures such that a profile of the decreasing temperature from top to bottom is established, so that the calcined trona passes downwardly in the vessel as it is being dissolved countercurrent to the upwardly flowing stream of aqueous sodium carbonate solution.

4,151,262

PROCESS FOR THE CATALYTIC CONVERSION OF ORGANIC CHLORINE COMPOUNDS

Christian Rasp, Cologne, and Gerhard Scharfe, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,551
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1977, 2703984
Int. Cl.[2] C01B 7/00; B01J 8/00; C01B 7/08
U.S. Cl. 423—240 9 Claims

1. Process for the catalytic conversion of organic chlorine compounds or mixtures of organic chlorine compounds which contain at least 1 atom of hydrogen per 1 chlorine atom into carbon dioxide and hydrogen chloride, using molecular oxygen, in the gas phase at elevated temperature in the presence of noble metal catalysts,

which comprises passing a gas containing the said organic chlorine compounds or mixtures and molecular oxygen

at elevated temperature from about 300°–700° C., over a catalyst system which has a catalyst zone A containing a platinum CATALYST AND VIRTUALLY NO OTHER CATALYTIC COMPONENT and a catalyst zone B containing a palladium Catalyst And Virtually No other Catalytic Component, and in

which the gas is first passed through catalyst zone A and then through catalyst zone B.

4,151,263

REMOVAL OF SULFUR OXIDES FROM GASES BY SCRUBBING WITH AMMONIACAL SOLUTIONS

Vincent T. Ciuryla, Stony Run, and Eugene J. Greskovich, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 29, 1977, Ser. No. 820,480
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 8 Claims

1. An improved process for the removal of sulfur dioxide from a sulfur dioxide-containing gas by scrubbing the gas with an aqueous ammoniacal scrubbing solution wherein the formation of plume, comprised of solid particulate matter, is prevented, which process comprises controlling the temperature and humidity throughout the gas phase and the composition of the scrubbing solution, all relative to each other, such that at each point within the gas phase the temperature is higher than about 0.5° F. below the dew point for such point by adding to the aqueous ammoniacal solution a sufficient quantity of a non-volatile, soluble salt to reduce the partial pressure of water vapor in equilibrium with the ammoniacal solution and to establish a relative humidity of the gas phase of less than about 95%.

4,151,264

PROCESS OF MELTING DOWN AND PURIFYING SILICON

Anton More; Rudolf Riedle; Herbert Straussberger; Willi Streckel, all of Burghausen, and Johann Muschi, Munich, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,127
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706175
Int. Cl.[2] C01B *33/02*
U.S. Cl. 423—348 4 Claims

1. A process of melting down and purifying silicon, which comprises melting silicon dust containing aluminum or aluminum and calcium impurities in at least half of the amount up to double of the amount of a silicate melt, heated by resistance heating up to a temperature of at least 1,420° C., said melt consisting of 2–30% by weight of calcium oxide, 5–35% by weight of magnesium oxide, wherein the sum of calcium oxide and magnesium oxide is 15–38% by weight, 0.5–28% by weight of aluminum oxide and 45–70% by weight of silicon dioxide, and wherein, to the melt at least 0.29% by weight of copper is added, calculated on the silicon amount, said copper being selected from the group consisting of elementary and chemically bound copper and a mixture thereof, and separating molten silicon from the silicate melt.

4,151,265

METHOD AND APPARATUS FOR REMOVING NITROGEN OXIDES FROM A GAS STREAM

Donald Ethington, Dimmitt, Tex., assignor to Goodpasture, Inc., Brownfield, Tex.

Continuation-in-part of Ser. No. 533,196, Dec. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 455,568, Mar. 28, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 638,043
Int. Cl.[2] C01C *1/18*
U.S. Cl. 423—396 13 Claims

1. A method for treating a gas stream containing nitrogen oxides and oxygen to produce a final product gas stream of reduced nitrogen oxides content and an aqueous solution of ammonium nitrate as a product which comprises:

providing a multi-stage liquid-gas contact apparatus with a plurality of contact stages arranged in series;

establishing in the first stage of said multi-stage gas-liquid contact apparatus an acidic aqueous solution of ammonium nitrate; introducing into said first stage a gas stream containing nitrogen oxides and oxygen;

simultaneously recycling through said first stage a first reaction liquid comprising an acidic aqueous solution of ammonium nitrate and a stream of an ammoniacal aqueous solution of ammonium nitrate, while maintaining the pH in said first stage at a pH of about 0.1 to about 3.5, said gas stream, first reaction liquid and stream of an aqueous ammoniacal solution of ammonium nitrate flowing concurrently through said first stage;

separating the gas and liquid exiting said first stage into a first stage product gas stream and a first stage product liquid stream;

introducing said first stage product gas stream into a second stage;

simultaneously flowing through said second stage a second reaction liquid comprising an ammoniacal aqueous solution of ammonium nitrate at a pH of about 7.5 to about 8.5, said first stage product gas stream and second reaction liquid flowing concurrently through said second stage;

separating the gas and liquid exiting said second stage into a second stage product gas stream and a second stage product liquid stream;

introducing said second stage product gas stream into a third stage;

simultaneously flowing through said third stage a third reaction liquid comprising water, said second stage product gas stream and third reaction liquid flowing concurrently through said third stage;

separating the gas and liquid exiting said third stage as a third stage product gas stream and a third stage product liquid stream; and

withdrawing said third stage product gas stream out of said multi-stage gas-liquid contact apparatus as a final product gas stream of reduced nitrogen oxides content.

4,151,266

METHOD FOR THE CONVERSION OF ANHYDROUS SODIUM CARBONATE TO WEGSCHEIDER'S SALT

Raymond J. Robey, Waltham, Mass., and John Capozzolo, Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 22, 1978, Ser. No. 918,179
Int. Cl.[2] C01D *7/14, 7/10*
U.S. Cl. 423—425 8 Claims

1. A method for the conversion of sodium carbonate, having a bulk density greater than 750 g/l into free-flowing, absorptive particles of Wegscheider's Salt, having a bulk density between 350 and 500 g/l which comprises:

(a) introducing anhydrous sodium carbonate particles into a reaction zone, which is preheated to a temperature between about 200° and 275° F.;

(b) heating said particles to a temperature between about 100° and 150° F.;

(c) introducing into said reaction zone a gaseous mixture containing from about 45 to 70 weight percent steam and about 30 to 55 weight percent carbon dioxide;
(d) intimately contacting said gaseous mixture with said particles while maintaining in said reaction zone a superatmospheric pressure of at least about 10 psig and a temperature between about 240° F. and about 275° F. until the contacted particles contain at least about 50 weight percent said Wegscheider's Salt product;
(e) removing said contacted particles from said reaction zone;
(f) drying those of said removed particles which have a free moisture content in excess of 5 percent by weight to reduce said moisture content to less than 5 percent by weight; and
(g) recovering said particles.

4,151,267

PROCESS FOR PRODUCING ALUMINA

Ferenc Puskás, 23, Monostori ut, Budapest III., Hungary

Continuation of Ser. No. 654,182, Feb. 2, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,891
Claims priority, application Hungary, Feb. 3, 1975, PU 193
Int. Cl.[2] C01F *7/42*
U.S. Cl. 423—626 **3 Claims**

1. In a process for the preparation of pure alumina wherein metallic aluminum is activated, the activated metallic aluminum is reacted in a aqueous solution to obtain an intermediate and then the intermediate is heat treated to obtain an alumina end product, the improvement in producing said intermediate which comprises employing aluminum having a purity of at least 99.5% and a specific surface of at least eight cm^2/g, activating only the surface of the aluminum by contacting it with an aqueous acidic solution of (1) NaCl, KCl, NH_4Cl, NH_4HCO_3 or ICl or (2) water containing dissolved CO_2, SO_2, Cl_2 or F_2, then washing said aluminum having only its surface activated with an aqueous medium having a neutral pH; then reacting the washed only surface activated aluminum in an aqueous solution and adjusting the pH of such solution to a basic pH to produce a fine-grained alumina.

3. In a process for the preparation of pure alumina wherein metallic aluminum is activated, the activated metallic aluminum is reacted in a aqueous solution to obtain an intermediate and then the intermediate is heat treated to obtain an alumina end product, the improvement in producing said intermediate which comprises employing aluminum having a purity of at least 99.5% and a specific surface of at least eight cm^2/g, activating only the surface of the aluminum by contacting it with an aqueous acidic solution of (1) NaCl, KCl, NH_4Cl, NH_4HCO_3 or ICl or (2) water containing dissolved CO_2, SO_2, Cl_2 or F_2, then washing said aluminum having only its surface activated with an aqueous medium having a neutral pH; then reacting the washed only surface activated aluminum in a aqueous solution and adjusting the pH of such solution to a neutral pH to produce alumina in a plate-like crystalline form.

4,151,268

BARBITURIC ACID ANTIGENS AND ANTIBODIES SPECIFIC THEREFOR

Sidney Spector, Livingston, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 670,210, Mar. 23, 1976, Pat. No. 4,107,157, which is a continuation of Ser. No. 378,744, Jul. 12, 1973, abandoned, which is a division of Ser. No. 174,517, Aug. 24, 1971, Pat. No. 3,766,162. This application Dec. 15, 1977, Ser. No. 860,810
Int. Cl.[2] G01N *33/16*
U.S. Cl. 424—1 **7 Claims**

1. A method for the assay of a 5-substituted-1,3-unsubstituted barbituric acid derivative in a sample which method comprises:

adding said sample to a solution containing a known amount of a labeled 5-substituted-1,3-unsubstituted-barbituric acid derivative and an antibody specific for 5-substituted-1,3-unsubstituted-barbituric acid derivatives consisting of a gamma globulin fraction protein having a multiplicity of sites which will selectively complex with said 5-substituted-1,3-unsubstituted-barbituric acid derivative,

measuring the percent inhibition of binding of said labeled 5-substituted-1,3-unsubstituted-barbituric acid derivative, and determining the amount of 5-substituted-1,3-unsubstituted-barbituric acid derivative present in said sample by comparing said percent inhibition value to a standard curve obtained by adding known amounts of said 5-substituted-1,3-unsubstituted-barbituric acid derivatives to a fixed mixture of said labeled 5-substituted-1,3-unsubstituted barbituric acid derivative and said antibody and determining the percent inhibition of binding for each known amount of said 5-substituted-1,3-unsubstituted-barbituric acid derivative.

4,151,269

HAIRDRESSING PREPARATION

Kenji Torii, and Kenichi Tomita, both of Tokyo, Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,540
Int. Cl.[2] A61K *7/06*
U.S. Cl. 424—47 **21 Claims**

1. A hairdressing preparation comprising in an amount imparting good dressability, good feeling in use, good washability from the hair and wearing apparel and extremely low eye irritation and toxicity at least one polyether compound resulting from the addition polymerization of 20 to 90 moles of propylene oxide to 1 mole of polyhydric alcohol to form a main chain, and the subsequent addition polymerization of 1 to 10 moles of ethylene oxide to the resulting main chain, the amount of ethylene oxide being further within the range of 1 to 10% by weight based on the total amount of propylene oxide and ethylene oxide, said polyhydric alcohol being one or more compounds containing 3-6 functional terminal hydroxyl groups, and a solvent selected from the group consisting of water and a water-alcohol mixture in an amount sufficient to form a liquid, a gel-like, a cream-like or an aerosol preparation.

4,151,270

CHEWING GUM COMPOSITION

Ronald L. Ream, North Aurora, and David M. Moore, Lombard, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Sep. 26, 1977, Ser. No. 836,383
Int. Cl.[2] A61K *9/68*
U.S. Cl. 424—48 **7 Claims**

1. A chewing gum composition essentially comprising gum base; a sweetener; flavoring additives; a palatable and safe amount of an organic acid selected from the group consisting of adipic, ascorbic, citric, fumaric, lactic, malic and tartaric acids, said organic acid being capable of stimulating salivation beyond that attributable to the act of chewing food and constituting at least 3 percent by weight of the final gum composition; and fructose constituting at least 10 percent by weight of the final gum composition.

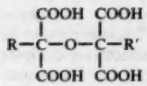
4,151,271

ORAL COMPOSITIONS

David R. Dyroff, Creve Coeur, Mo.; Walton F. Suchanek, Jr., Belleville, Ill., and Thomas G. Schiff, Clayton, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 737,817, Nov. 1, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,709
Int. Cl.[2] A61K *7/16, 7/24, 9/68, 31/19*
U.S. Cl. 424—48 **11 Claims**

1. An oral composition effective in inhibiting formation of dental calculus, said composition comprising (1) a compound selected from the group consisting of acids having the formula:



wherein R is lower normal alkyl and R' is lower normal alkyl, and pharmaceutically acceptable salts of the acids, and (2) a carrier suitable for use in the oral cavity, the compound being present in the composition in an amount and concentration sufficient to substantially inhibit formation of dental calculus.

4,151,272

WAX-LIKE ANTIPERSPIRANT STICK COMPOSITIONS

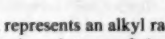
Daniel C. Geary, Randolph, N.J., and Helga Krevald, Tarrytown, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 710,951, Aug. 2, 1976, abandoned. This application Jan. 13, 1978, Ser. No. 869,077

Int. Cl.[2] **A61K** *7/34, 7/36, 7/38*

U.S. Cl. 424—68 **12 Claims**

1. An antiperspirant stick consisting essentially of from about 15 to 30% by weight of a wax-like fatty alcohol, from about 15 to 35% by weight of an astringent material, in an amount up to about 80% by weight of a volatile silicone, from about 0.01 to 5% by weight of a polyethoxylated fatty alcohol represented by the formula:



wherein R represents an alkyl radical of about 16 to 18 carbon atoms and n is an integer of about 100 to 200.

4,151,273

INCREASING THE ABSORPTION RATE OF INSOLUBLE DRUGS

Sidney Riegelman, San Francisco, Calif., and Win L. Chiou, Glen Ellyn, Ill., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 519,569, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 243,852, Apr. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 94,499, Dec. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 10, Jan. 2, 1970, abandoned. This application Jun. 13, 1978, Ser. No. 915,007

Int. Cl.[2] **A61K** *47/00, 31/34, 31/74, 9/20*

U.S. Cl. 424—78 **12 Claims**

1. In the art of obtaining an effective concentration of griseofulvin of a single, oral dosage in humans, the improvement of administering to a human subject an effective concentration dosage of griseofulvin which has been prepared by forming a mixture of polyethylene glycol having an average molecular weight of from 1,000 to 20,000 and from about 2% to about 50% of griseofulvin, heating the mixture to an elevated temperature sufficient to dissolve the griseofulvin without decomposition in the polyethylene glycol and rapidly cooling instantaneously within 2 to 3 minutes, the griseofulvin-polyethylene glycol mixture to produce a solid solution of griseofulvin in the polyethylene glycol.

4,151,274

PROCESS AND COMPOSITION FOR THE PRODUCTION OF SUPPOSITORIES

Karl W. Schlueter, Hamburg, and Eckhard Schulz-Kaiser, Halstenbek, both of Fed. Rep. of Germany, assignors to Karl-Werner Schlueter G.m.b.H., Hamburg, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 741,986

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551446

Int. Cl.[2] **A61K** *9/02*

U.S. Cl. 424—80 **17 Claims**

1. A process for the production of suppositories comprising the steps of:

(a) mixing a major portion of 1,2-propylene glycol myristate with a minor portion of at least one 1,2-propylene glycol ester selected from the group consisting of 1,2-propylene glycol palmitate and 1,2-propylene glycol stearate in dry form with at least one pharmacologically active ingredient for suppositories to form a dry mixture;

(b) moistening the mixture with the solution of at least one film-forming physiologically acceptable hydrophilic polymer binding agent in an aqueous or organic solvent for said binding agent to form a uniformly moistened mixture at a sufficiently low temperature to avoid melting of the mixture;

(c) pressing the moistened mixture through a sieve plate to obtain a granulate;

(d) drying the granulate at a sufficiently low temperature to avoid melting of the granulate; and

(e) pressing the granulate into suppositories at a temperature of between −10° C. and room temperature in a high speed eccentric or rotary tableting machine capable of producing at least about 50 tablets per minute.

4,151,275

STABILIZED IODINE TINCTURE

Abraham Cantor, Elkins Park, Pa., and Murray W. Winicov, Flushing, N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.

Continuation of Ser. No. 693,724, Jun. 7, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,012

Int. Cl.[2] **A61K** *31/79, 33/18*

U.S. Cl. 424—80 **2 Claims**

1. A povidone modified iodine tincture comprising an aqueous ethanolic solution containing per 100 ml 1.8–2.2 grams of iodine, 2.1 to 2.6 grams of sodium iodide, an amount of povidone within the range of 0.25 to 2.5 parts per part by weight of iodine, and the amount of ethanol in said aqueous ethanolic solution being 25–95% V/V of the solvents of said modified tincture.

4,151,276

METHOD OF SUPPRESSING GASTRIC ACID SECRETION BY THE ORAL ADMINISTRATION OF CALCITONIN

Francine B. Caulin, Saint Mande, France, and James W. Bastian, Park Forest, Ill., assignors to Armour Pharmaceutical Company, Scottsdale, Ariz.

Filed May 12, 1975, Ser. No. 576,752

Int. Cl.[2] **A61K** *35/46*

U.S. Cl. 424—111 **8 Claims**

1. A method of suppressing gastric acid secretion in a mammalian host when the suppression of gastric acid secretion in such host is medically desirable comprising administering orally to said host an effective amount of calcitonin selected from the group consisting of calcitonin obtained from salmon, trout, eel, porcine, human or chicken, the synthetic counterparts thereof, and mixtures of any of the foregoing, or their non-toxic pharmaceutically acceptable salts sufficient to suppress gastric acid secretion in said host by local action but insufficient to produce significant systemic effects normally associated with parenteral calcitonin and administration.

4,151,277
NON-GLYCOSIDIC THEOPHYLLINE-SUGAR DERIVATIVES

Hans P. Albrecht, Weinheim; Ludwig Friedrich, Bruehl, and Frank Zimmermann, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

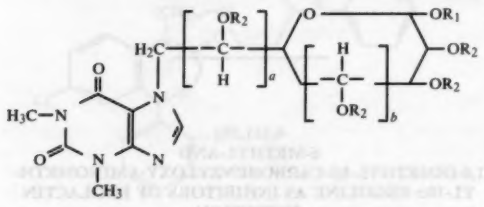
Filed Mar. 13, 1978, Ser. No. 885,646

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714883

Int. Cl.[2] **A61K** *31/70;* **C07G** *3/00*

U.S. Cl. 424—180 **16 Claims**

1. A theophylline-sugar compound of the formula



wherein R_1 taken alone is alkyl having 1 to 4 carbon atoms, R_2 taken alone is hydrogen, aliphatic acyl having 1–4 carbon atoms, benzoyl, nicotinoyl, or clofibrinyl; wherein any two adjacent R_2 groups taken together or R_1 and adjacent R_2 taken together may also be an acetal or ketal protective group having up to 5 carbon atoms; and wherein a and b are the integer 0 or 1 but a and b may not both be 1.

15. A pharmaceutical composition suitable for the treatment of hyperlipemia comprising a hypolipemically-effective amount of a compound as in claim **1** in combination with a pharmaceutically acceptable carrier.

16. A method of treating hyperlipemia in a patient suffering therefrom which comprises orally administering to said patient a hypolipemically-effective amount of a compound as in claim **1**.

4,151,278
PROCESS FOR THE PREPARATION OF AN EXTRACT OF *TEUCRIUM MARUM* USED IN PARTICULAR IN THERAPY

Jacques Debat, Saint Cloud; Jean Lemoine, Garches; Bernard Guay, Saint Cloud, and Claude Crescioni, Garches, all of France, assignors to Institut de Recherches Chimiques et Biologiques Appliquees, Paris, France

Filed Oct. 14, 1977, Ser. No. 842,364

Claims priority, application United Kingdom, Oct. 15, 1976, 43043/76

Int. Cl.[2] **A61K** *35/78;* **C07G** *17/00*

U.S. Cl. 424—195 **14 Claims**

1. A process for the preparation of an extract of *Teucrium marum*, which process comprises extracting at least a portion of the stems, leaves, floral apices, fruit, or roots of the Teucrium marum plant with a solvent chosen from the group consisting of boiling water in the presence of NH_3, pentane, hexane, heptane, cyclohexane, cyclopentane, petroleum ether, methylene chloride and mixtures thereof and purifying the resulting extract, the purified extract having antispasmodic therapeutic activity.

10. A process according to claim **1** wherein the plant is treated with a solvent chosen from the group consisting of pentane, hexane, heptane, cyclopropane, cyclohexane, petroleum ether and mixtures thereof, at a rate of 30 to 150 g of plant per litre of solvent, the extract is filtered and the filtrate is collected and evaporated to dryness in vacuo, and the residue from evaporation is subjected to a purification comprising successively:

treatment of the residue with hexane at a rate of 1 volume of hexane per 10 volumes of initial solvent and collection of the hexane phase;

absorption of the hexane phase on silica;

elution of the silica with a mixture of hexane and ether (90:10 v/v); and

evaporation to dryness under reduced pressure of the eluate.

12. An extract of *Teucrium marum* prepared according to the process of claim **10**, and exhibiting (i) three absorption bands at 2,700–3,000 cm^{-1}, 1,700–1,730 cm^{-1} and 1,380–1,460 cm^{-1} in its infra-red spectrum, and (ii) an Rf of 0.45 by chromatography on a thin layer of silica.

13. An extract of *Teucrium marum* obtained according to the process of claim **1**.

14. An antispasmodic and analeptic composition which comprises a physiologically acceptable excipient and a pharmaceutically effective amount of at least one extract of *Teucrium marum* according to claim **12**.

4,151,279
FUNGICIDAL N-CARBAMYLOXY-2,3-DISUBSTITUTED 4-TRIHALOMETHYL-6-OXOTETRAHYDRO-1,3-OXAZINES

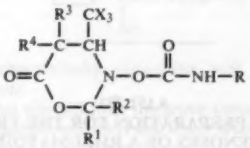
Malcolm S. Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 19, 1978, Ser. No. 916,434

Int. Cl.[2] **A61K** *31/535;* **C07D** *265/06*

U.S. Cl. 424—248.5 **11 Claims**

1. A compound of the formula



wherein

R^1 and R^2 individually are alkyl of 1 to 6 carbon atoms, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 6 carbon atoms,

X is chloro or bromo,

R^3 and R^4 individually are hydrogen, chloro, bromo or alkyl of 1 to 6 carbon atoms,

R is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, or pheny substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 6 carbon atoms, with the proviso that two R^1 and R^2 groups may together form a divalent alkylene group of 3 to 5 carbon atoms.

10. A method for the control of plant fungi which comprises applying to said fungi or their plant hosts a fungicidally effective amount of the compound defined in claim **1**.

4,151,280
PYRROLOQUINOXALINES

David A. Rowlands, Cirencester, and John B. Taylor, Crucis near Cirencester, both of England, assignors to Roussel Uclaf, Paris, France

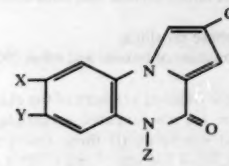
Filed Apr. 10, 1978, Ser. No. 895,264

Claims priority, application United Kingdom, Apr. 13, 1977, 15350/77

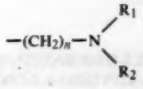
Int. Cl.[2] **C07D** *487/04;* **A61K** *31/495*

U.S. Cl. 424—250 **27 Claims**

1. A compound selected from the group consisting of a compound of the formula



wherein X and Y are individually selected from the group consisting of hydrogen, halogen, alkyl and alkoxy of 1 to 5 carbon atoms and $-NO_2$, Z is selected from the group consisting of alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, alkenyl of 2 to 6 carbon atoms and phenyl and R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms,



and non-toxic, pharmaceutically acceptable cations, n is an integer from 1 to 6 and R_1 and R_2 are individually alkyl of 1 to 5 carbon atoms and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

14. An antiallergic composition comprising an antiallergically effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

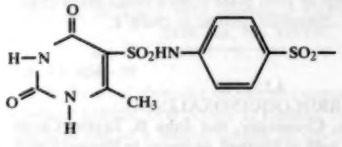
4,151,281

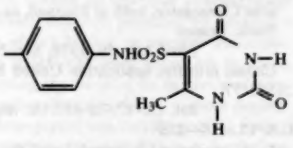
MEDICINAL PREPARATION FOR THE TREATMENT OF COLLAGENOSES OF A RHEUMATOID NATURE

Nikolai M. Goloschapov, ulitsa Druzhby, 9, kv. 110, Zagorsk Moskovskoi oblasti; Yakov A. Sigidin, Kutuzovsky prospekt, 5/3, korpus 2, kv. 132; Elena S. Tsvetkova, ulitsa Novatorov, 20, korpus 1, kv. 119, both of Moscow; Ida L. Bilich, ulitsa Nikolaya Ershova, 55, kv. 24, Kazan; Vladimir S. Reznik, ulitsa Gospitalnaya, 34, kv. 34, Kazan; Nikolai G. Pashkurov, ulitsa Druzhby, 6, kv. 20, Kazan; Galina F. Zaika, ulitsa Druzhby, 9, kv. 110, Zagorsk Moskovskoi oblasti, and Abdurakhim A. Muslinkin, ulitsa Zhdanova, 60, kv. 33, Kazan, all of U.S.S.R.

Filed Oct. 20, 1977, Ser. No. 843,818
Int. Cl.[2] A61K *31/505*; C07D *239/00*
U.S. Cl. 424—251 **5 Claims**

1. A medicinal preparation for the treatment of collagenoses of a rheumatoid nature, comprising, as the active principle, a medicinally effective amount of p,p-/2,4-dioxy-6-methylpyrimidinyl-5-sulfonamino/diphenyl sulfone with the following formula:





and a pharmaceutical carrier for said active principle.

4,151,282

COMPOSITIONS AND METHODS FOR TREATING DIABETIC COMPLICATIONS

William J. Welstead, Jr., and Warren N. Dannenburg, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Dec. 29, 1977, Ser. No. 865,756
Int. Cl.[2] A61K *31/47*
U.S. Cl. 424—258 **3 Claims**

1. A method for the prevention or amelioration of diabetes complications consisting of cataracts in a diabetic animal which comprises orally administering to said animal an efffective amount of 5,6-dihydro-4H-pyrrolo[3,2,1-ij]quinoline-1,2-dione.

4,151,283

6-METHYL-AND 1,6-DIMETHYL-8β-CARBOBENZYLOXY-AMINOMETHYL-10α-ERGOLINE AS INHIBITORS OF PROLACTIN SECRETION

Enrico di Salle; Claudio Praga, and Erminia Castegnaro, all of Milan, Italy, assignors to Società Farmaceutici Italia S.p.A., Milan, Italy

Filed Jun. 28, 1977, Ser. No. 810,872
Claims priority, application United Kingdom, Feb. 17, 1977, 6581/77
Int. Cl.[2] A61K *19/48*
U.S. Cl. 424—261 **1 Claim**

1. A method of inhibiting prolactin secretion in a female mammal in need of such therapy which comprises administering to the mammal an effective dose of a compound selected from the class consisting of 6-methyl-8β-carbobenzyloxy-aminomethyl-10α-ergoline, 1,6-dimethyl-8β-carbobenzyloxy-aminomethyl-10α-ergoline, and pharmaceutically acceptable acid addition salts thereof.

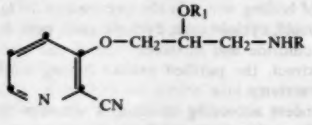
4,151,284

SUBSTITUTED (3-LOWERALKYLAMINO-2-R_1O-PROPOXY)PYRIDINES, ANTIHYPERTENSIVE COMPOSITIONS AND METHODS CONTAINING SAME

John J. Baldwin, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 696,260, Jun. 15, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,957
Int. Cl.[2] C07D *213/57*; A61K *31/44*
U.S. Cl. 424—263 **7 Claims**

1. A compound having the formula:



wherein
R is C_3–C_4 branched alkyl
R_1 is hydrogen
and pharmaceutically acceptable salts thereof.

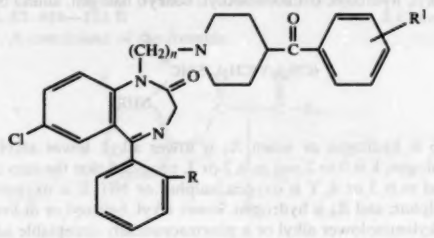
6. A method of treating hypertension in hypertensive animals which comprises administering an effective amount of a compound of claim **1**.

4,151,285
1,5-DISUBSTITUTED-1,2-DIHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES

William J. Welstead, Jr., and Robert F. Boswell, Jr., both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed May 12, 1978, Ser. No. 905,268
Int. Cl.[2] C07D *243/24;* A61K *31/55*
U.S. Cl. 424—267 12 Claims

1. A compound selected from 1,5-disubstituted-1,2-dihydro-2H-1,4-benzodiazepin-2-ones having the formula:



wherein;

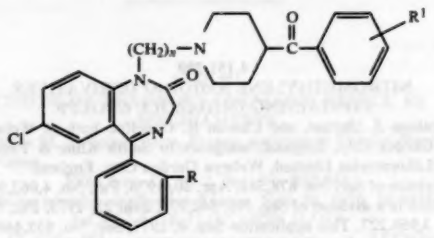
R is hydrogen or fluorine,

R^1 is hydrogen, fluoro, chloro, bromo or trifluoromethyl,

n is a positive integer from 2 to 4 inclusive, and

non-toxic pharmaceutically acceptable acid addition salts thereof.

9. A method for treating anxiety in a host comprising administering to a host suffering from anxiety an effective amount of a compound selected from those having the formula:



wherein;

R is hydrogen or fluorine,

R^1 is hydrogen, fluoro, chloro, bromo or trifluoromethyl,

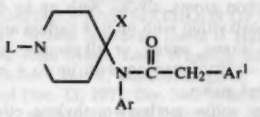
n is a positive integer from 2 to 4 inclusive.

4,151,286
N-ARYL-N-(1-L-4-PIPERIDINYL)-ARYLACETAMIDES

Stefan Sanczuk, Vosselaar, and Hubert K. Fr. Hermans, Gierle, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 795,669, May 11, 1977, Pat. No. 4,126,689, which is a continuation-in-part of Ser. No. 713,756, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,131, Sep. 23, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 924,490
Int. Cl.[2] C07D *409/12;* A61K *31/445*
U.S. Cl. 424—267 5 Claims

1. A chemical compound selected from the group consisting of an N-aryl-N-(4-piperidinyl)arylacetamide having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

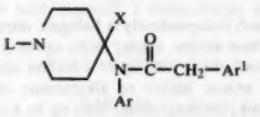
L is a member selected from the group consisting of hydrogen, cycloalkyllower alkyl and lower alkenyl, said cycloalkyl having 3 to 6 carbon atoms;

Ar is a member selected from the group consisting of phenyl, mono- and di-substituted phenyl, wherein each substituent in said mono- and di-substituted phenyl is independently selected from the group consisting of halo and lower alkyl;

Ar^1 is thienyl; and

X is a member selected from the group consisting of hydrogen, lower alkyloxycarbonyl and lower alkyloxymethyl.

4. A pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective anti-arrhythmic amount of a chemical compound selected from the group consisting of an N-aryl-N-(4-piperidinyl)arylacetamide having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

L is a member selected from the group consisting of hydrogen, cycloalkyllower alkyl and lower alkenyl, said cycloalkyl having 3 to 6 carbon atoms;

Ar is a member selected from the group consisting of phenyl, mono- and di-substituted phenyl, wherein each substituent in said mono- and di-substituted phenyl is independently selected from the group consisting of halo and lower alkyl;

Ar^1 is thienyl; and

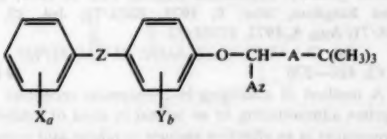
X is a member selected from the group consisting of hydrogen, lower alkoxycarbonyl and lower alkyloxymethyl.

4,151,287
COMBATING FUNGI WITH 1-DIARYLOXY-1-TRIAZOLYL-3,3-DIMETHYL-BUTAN-2-ONES AND BUTAN-2-OLS

Wolfgang Krämer; Karl Heinz Büchel, both of Wuppertal; Wilhelm Brandes, Cologne, and Helmut Kaspers, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 629,428, Nov. 6, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,861
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1974, 2455955
Int. Cl.[2] A01N *9/00;* C07D *249/08*
U.S. Cl. 424—269 10 Claims

1. A 1-diaryloxy-1-triazolyl-3,3-dimethyl-butan-2-one or -butan-2-ol of the formula



in which

X and Y each independently is halogen, nitro, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, halogenoalkylthio with up to 4 carbon atoms and up to 5 halogen atoms, amino, or alkylamino, dialkylamino or N-alkyl-alkylsulfonamino with up to 4 carbon atoms in each alkyl group,

Z is oxygen, sulfur, methoxy-methylene, ethoxy-methylene, sulfonyl or C=O,

A is C=O or —CH(OH)—,

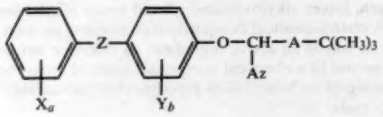
Az is 1,2,4-triazolyl-(1), 1,2,4-triazolyl-(4) or 1,2,3-triazolyl-(1),

b is 0, 1, 2 or 3, and

a is 1, 2 or 3, and may also be 0 when Z is sulfur, methoxy-methylene, ethoxy-methylene, sulfonyl or C=O,

or a salt thereof.

6. A fungicidal composition comprising a diluent and a fungicidally effective amount of a 1-diaryloxy-1-triazolyl-3,3-dimethyl-butan-2-one or -butan-2-ol of the formula



in which

X and Y each independently is halogen, nitro, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, halogenoalkylthio with up to 4 carbon atoms and up to 5 halogen atoms, amino or alkylamino, dialkylamino or N-alkyl-alkylsulfonylamino with up to 4 carbon atoms in each alkyl group,

Z is oxygen, sulfur, methoxy-methylene, ethoxy-methylene, sulfonyl or C=O,

A is C=O or —CH(OH)—,

Az is 1,2,4-triazolyl-(1), 1,2,4-triazolyl-(4) or 1,2,3-triazolyl-(1),

b is 0, 1, 2 or 3, and

a is 1, 2 or 3 and may also be 0 when Z is sulfur, methoxy-methylene, ethoxy-methylene, sulfonyl or C=O,

or a salt thereof.

4,151,288

PHARMACOLOGICALLY ACTIVE THIOUREA AND UREA COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

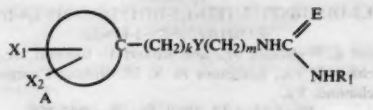
Division of Ser. No. 758,291, Jan. 5, 1977, Pat. No. 4,069,327, which is a division of Ser. No. 637,494, Dec. 4, 1975, Pat. No. 4,018,931, which is a division of Ser. No. 451,333, Mar. 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Sep. 29, 1977, Ser. No. 837,961

Claims priority, application Ireland, Feb. 3, 1972, 136/72; United Kingdom, Mar. 9, 1971, 6352/71; Jul. 22, 1971, 34334/71; Aug. 8, 1972, 37015/72

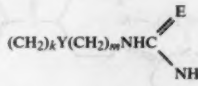
Int. Cl.[2] **A61U** *31/41, 31/42, 31/415, 31/425*

U.S. Cl. 424—270 **29 Claims**

1. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a thiazole, isothiazole, oxazole, isoxazole, or thiadiazole ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



;

X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen, k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or sulphur; and R_1 is hydrogen, lower alkyl, benzoyl or di-lower alkylaminolower alkyl or a pharmaceutically acceptable addition salt thereof.

4,151,289

NITROMETHYLENE AMIDINO DERIVATIVES CONTAINING IMIDAZOLE GROUPS

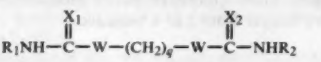
Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 678,563, Apr. 20, 1976, Pat. No. 4,062,967, which is a division of Ser. No. 542,971, Jan. 22, 1975, Pat. No. 3,968,227. This application Sep. 8, 1977, Ser. No. 831,449

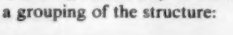
Int. Cl.[2] **A61K** *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 R **10 Claims**

1. A compound of the formula:



wherein R_1 and R_2, which may be the same or different, each represent a grouping of the structure:



wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3; and the sum of m and n is 3, 4 or when Y is cyano, 2; X_1 and X_2 are both $CHNO_2$ or one of X_1 and X_2 is $CHNO_2$ and the other is NY wherein Y is cyano; W is NH; and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

9. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said H-2 histamine receptors in an effective amount to inhibit said H-2 histamine receptors a compound of claim **1**.

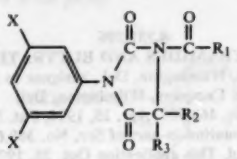
4,151,290

FUNGICIDAL 1-CYCLOALKYLCARBONYL-3-(3,5-DIHALOPHENYL-)IMIDAZOLIDINE-2,4-DIONES

Chiyozo Takayama, Toyonaka; Toshiro Kato, Ibaraki; Shigeo Yamamoto, Ikeda; Yoshio Hisada, Kawanishi; Nobuyuki Kameda, and Akira Fujinami, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 16, 1977, Ser. No. 851,899
Claims priority, application Japan, Dec. 3, 1976, 51-145915
Int. Cl.[2] A61K *31/415;* C07D *233/80*
U.S. Cl. 424—273 R 8 Claims

1. A compound of the formula:



wherein X is a chlorine or bromine atom, R_1 is a C_3–C_6 cycloalkyl, tetramethylcyclopropyl, 2,2-dimethyl-3-isobutenylcyclopropyl or 2,2-dimethyl-3-dichlorovinylcyclopropyl group and R_2 and R_3 are individually a hydrogen atom or a methyl group.

8. A method for controlling fungi which comprises applying a fungicidally effective amount of the compound according to claim 1 to the fungi.

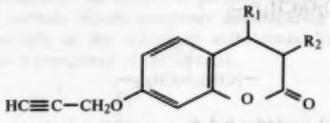
4,151,291

ETHERS OF 7-HYDROXY-COUMARIN USEFUL AS MEDICAMENTS

Francois M. J. Vallet, Paris, France, assignor to Unicler, Paris, France

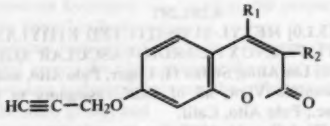
Filed Nov. 17, 1977, Ser. No. 852,442
Claims priority, application France, Nov. 24, 1976, 76 35331
Int. Cl.[2] A61K *31/37;* C07D *311/16*
U.S. Cl. 424—281 13 Claims

1. A compound of the formula



wherein each of R_1 and R_2 is independently hydrogen, C_{1-4} alkyl, C_{1-4} alkenyl, carboxy, C_{2-5} alkoxycarbonyl or nitrophenyl, or a pharmaceutically acceptable salt thereof.

5. An analgesic composition in dosage unit form comprising as active ingredient an analgesically effective amount of a compound of the formula:



wherein each of R_1 and R_2 is independently hydrogen, C_{1-4} alkyl, C_{1-4} alkenyl, carboxy, C_{2-5} alkoxycarbonyl or nitrophenyl; or a pharmaceutically acceptable salt thereof.

4,151,292

COMPOSITION AND METHODS OF USE

Thomas S. C. Orr, Melton Mowbray; David E. Hall, Burton-on-the-Wolds, and John Mann, Long Whatton, all of England, assignors to Fisons Limited, London, England

Filed Dec. 23, 1977, Ser. No. 863,859
Claims priority, application United Kingdom, Jan. 25, 1977, 2872/77
Int. Cl.[2] A61U *31/40, 31/415, 31/625*
U.S. Cl. 424—273 P 13 Claims

1. A pharmaceutical composition adapted for oesophageal administration to a mammal comprising, as active ingredient, at least one chromone compound selected from 1,3-bis(2-carboxychromon-5-yloxy)propan-2-ol; 5-(2-hydroxypropoxy)-8-propyl-chromone-2-carboxylic acid; 6,7,8,9-tetrahydro-4-oxo-10-propyl-4H-naphtho[2,3-b]pyran-2-carboxylic acid; 6,7,8,9-tetrahydro-5-hydroxy-4-oxo-10-propyl-4H-naphtho[2,3,-b]pyran-2-carboxylic acid or a pharmaceutically acceptable salt of any one thereof, in combination with an anti-inflammatory selectd from phenylbutazone, oxyphenbutazone, and mixtures thereof, said composition containing 0.14 to 2000 parts by weight of said anti-inflammatory per part of said active ingredient.

12. A method of administering an anti-inflammatory to a mammal with inhibition of adverse gastrointestinal effects due to said anti-inflammatory which method comprises orally administering to said mammal a composition according to claim 1.

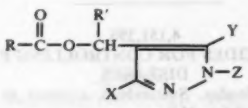
4,151,293

INSECTICIDAL PYRAZOLE-4-METHANOL ESTERS

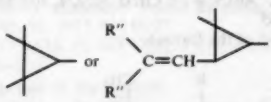
Robert G. Stein, Kenosha, Wis., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 23, 1978, Ser. No. 953,714
Int. Cl.[2] A61K *31/415;* C07D *231/12*
U.S. Cl. 424—273 P 17 Claims

1. A compound of the formula

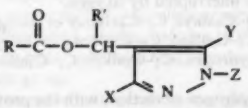


wherein R is phenyl, benzyl, 1-isopropylbenzyl wherein each of said aromatic rings may carry a chlorine substituent,

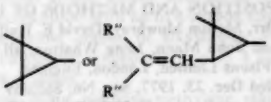


R′ is H, —C≡N or —C≡CH;
R″ is chlorine, bromine, fluorine or methyl; X and Y both but independently are H or loweralkyl; and and Z is phenyl or benzyl which may carry an optional aromatic chlorine substituent.

9. An agronomically acceptable composition for controlling mites, insects or their eggs, containing as the active ingredient, between 1 and 20% by weight of a compound of the formula



wherein R is phenyl, benzyl, 1-isopropylbenzyl wherein each of said aromatic rings may carry a chlorine substituent,



R′ is H, —C≡N or —C≡CH;
R″ is chlorine, bromine, fluorine or methyl; X and Y both but independently are H or loweralkyl; and and Z is phenyl or benzyl which may carry an optional aromatic chlorine substituent, and an agronomically acceptable carrier.

4,151,294

ALKYNOLS AND PROCESS FOR THEIR PREPARATION

Hans-Adolf Kurmeier; Erich Schacht; Joachim Gante; Dieter Orth; Zdenek Simane, and Albrecht Wild, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

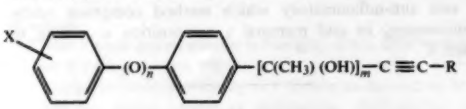
Filed Jun. 9, 1977, Ser. No. 805,045

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626018

Int. Cl.[2] **C07C** *33/06, 43/28;* **A61K** *31/35, 31/085*

U.S. Cl. 424—283 **17 Claims**

1. An alkynol of the formula



wherein X is F, Cl or Br; n is 0 or 1; m is 0 or 1 and R, when m is 0, is hydroxyalkyl of 1–6 carbon atoms, or, when m is 1, is alkyl or straight-chain tetrahydropyran-2-yloxyalkyl, each alkyl being of 2–6 carbon atoms.

17. A method of treating inflammation in an animal comprising administering to the afflicted animal an amount of a compound of claim 1 effective to lower the serum triglyceride level.

4,151,295

MICROBICIDES FOR CONTROLLING PLANT DISEASES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

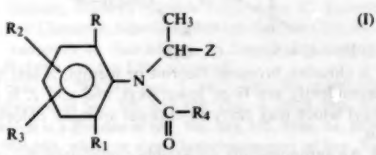
Filed Mar. 24, 1978, Ser. No. 889,700

Claims priority, application Switzerland, Mar. 29, 1977, 3929/77

Int. Cl.[2] **A01N** *9/28;* **C07D** *307/24, 307/68*

U.S. Cl. 424—285 **20 Claims**

1. A compound of the formula



(I)

wherein

Z represents a methyl radical or an ethyl radical which can be interrupted by oxygen, or represents a propyl radical which can be interrupted by oxygen,

R represents C_1–C_4alkyl, C_1–C_4alkoxy or halogen,

R_1 represents C_1–C_3alkyl, C_1–C_4alkoxy or halogen,

R_2 represents hydrogen, C_1–C_3alkyl, C_1–C_4alkoxy or halogen,

R_3 represents hydrogen or methyl, with the proviso that the total number of carbon atoms of the substituents in the phenyl ring does not exceed 8,

R_4 represents one of the following groups: a 2-furanyl or 2-tetrahydrofuranyl group which is unsubstituted or substituted by halogen, Y—O—R_5 or —CH_2—S—R_5, wherein

Y represents —CH_2—, —CH_2—CH_2— or —CH-$_2$—CH(CH_3)—, and

R_5 represents C_1–C_4alkyl, C_3–C_4alkenyl or C_3–C_4alkynyl.

19. A method of controlling phytopathogenic fungi and preventing attack by fungus, which comprises treating plants, parts of plants or their environment with a fungicidally effective amount of a compound of claim 1.

4,151,296

BUTYRAMIDES AND BUTYRATES

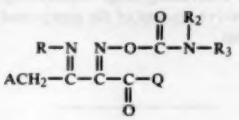
Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 463,987, Apr. 25, 1974, Pat. No. 4,059,623, which is a continuation-in-part of Ser. No. 369,606, Jun. 13, 1973, abandoned. This application Oct. 25, 1977, Ser. No. 845,052

Int. Cl.[2] **A01N** *9/00, 9/20, 9/22*

U.S. Cl. 424—298 **14 Claims**

1. An aphicidal composition consisting essentially of (1) at least one of (a) an inert diluent and (b) a surfactant and (2) an aphicidally effective amount of a compound of the formula



wherein:

A is hydrogen or methyl;

R is C_1–C_{18} alkyl; C_3–C_4 alkenyl; C_5–C_7 cycloalkyl optionally substituted with methoxy or with 1 or 2 methyl groups; C_6–C_8 cycloalkylalkyl; C_1–C_3 alkoxy; alkoxyalkyl with a total of 3–6 carbon atoms;

R_2 is hydrogen, methyl, or ethyl;

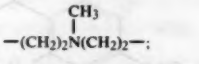
R_3 is methyl, ethyl, or allyl;

Q is —NR_5R_6;

R_5 is methoxy, C_1–C_4 alkyl or allyl;

R_6 is hydrogen, methyl, or ethyl;

R_5 and R_6 can be taken together to form a ring and are —$(CH_2)_2O(CH_2)_2$—;



or —$(CH_2)_n$—; and n is 4–6;

provided that the total carbon content of Q, R_2, and R_3 is not greater than 8C.

4,151,297

BICYCLO [3.1.0] HEXYL-SUBSTITUTED ETHYLAMINO CARBONYL PHENOXY CARDIOVASCULAR AGENTS

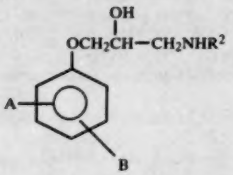
Karl G. Untch, Los Altos; Stefan H. Unger, Palo Alto, and Brian Lewis, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 31, 1977, Ser. No. 846,953

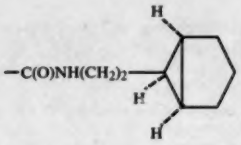
Int. Cl.[2] **C07B** *103/737;* **C07D** *263/06;* **A61K** *31/165, 31/42*

U.S. Cl. 424—304 **57 Claims**

1. A compound of the formula



wherein R^2 is C_1 to C_4 linear or branched alkyl, C_1 to C_4 linear or branched carboalkoxy, nitrile or nitro; the group A is is hydrogen, halo, nitrile, C_1 to C_2 alkyl, C_1 to C_2 alkoxy, acetyl or propionyl; B is the group



and pharmaceutically acceptable salts thereof with the proviso that when group B is at the 4 position of the carbocyclic aryl ring, the substituent A is at position 2 or 3 of said ring and when group B is at the 3 position of the carbocyclic aryl ring, the substituent A is at position 4 or 6 of said ring.

55. A pharmaceutical composition for treating cardiovascular disorders in mammals by blocking the beta-adrenergic receptor sites, consisting essentially of a pharmaceutically acceptable carrier and an amount effective to block said beta-adrenergic receptor sites of an agent selected from the group of compounds of claim **1** and mixtures thereof.

4,151,298

ANTHELMINTIC COMPOSITIONS

Jozef Drabek, Oberwil, and Alfred Meyer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

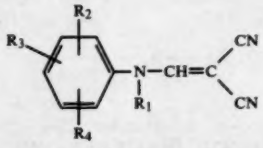
Filed Jan. 6, 1978, Ser. No. 867,653

Claims priority, application Switzerland, Jan. 10, 1977, 266/77; Dec. 7, 1977, 15001/77

Int. Cl.[2] **A01N** *9/20;* **C07C** *121/78*

U.S. Cl. 424—304 **4 Claims**

1. A process for the control of parasitic helminths in warm blooded animals which comprises administering orally or subcutaneously to the animal an anthelmintically effective amount of a compound of the formula



wherein

R_1 represents hydrogen, C_1–C_6 alkyl, the propargyl group or the benzyl radical,

R_2 represents hydrogen, C_1–C_4 alkyl, halogen, the trifluoromethyl group, the nitro group or the cyano group.

R_3 represents hydrogen, halogen, the trifluoromethyl group or the nitro group, and

R_4 represents hydrogen or halogen,

with the proviso that R_1 may only be the propargyl group or the benzyl radical if at least one of the symbols R_2 or R_3 represents the trifluoromethyl group.

4,151,299

CERTAIN ANILINE DERIVATIVES AS MICROBICIDAL AGENTS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

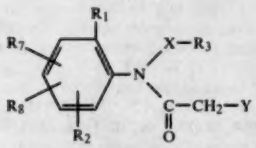
Continuation of Ser. No. 565,037, Apr. 4, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,826

Claims priority, application Switzerland, Apr. 9, 1974, 4995/74; Mar. 14, 1975, 3259/75

Int. Cl.[2] **A01N** *9/20;* **C07C** *101/48*

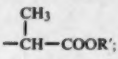
U.S. Cl. 424—309 **23 Claims**

1. A fungicidal composition comprising as active component a fungicidally effective amount of a compound of the formula I



(I)

wherein R_1 is methyl; R_2 is in ortho position to the amino group and is methyl, ethyl or chlorine; R_7 and R_8 independently are hydrogen or methyl; X-R_3 is



R′ is methyl; and Y is —OR_4 or —SR_4 in which R_4 is methyl, ethyl, propyl, isopropyl, butyl, sec. butyl or tert. butyl; together with a suitable carrier therefor.

4,151,300

ACETOHYDROXAMIC ACIDS

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

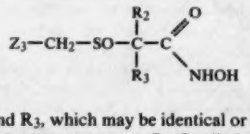
Division of Ser. No. 778,543, Mar. 17, 1977, Pat. No. 4,122,186. This application Aug. 4, 1978, Ser. No. 930,927

Claims priority, application United Kingdom, Mar. 23, 1976, 11710/76; Feb. 15, 1977, 06298/77

Int. Cl.[2] **A61K** *31/185;* **C07C** *83/10;* **C07D** *317/46*

U.S. Cl. 424—315 **14 Claims**

1. A compound of the formula:



(in which R_2 and R_3, which may be identical or different, each represent a hydrogen atom or a C_1–C_6-alkyl group, and Z_3 represents an optionally substituted aryl group, especially an α-naphthyl, β-naphthyl or phenyl group, each of which can be substituted by one or more C_1–C_4-alkyl groups, C_1–C_4-alkoxy groups, methylenedioxy groups, halogen, CF_3, NO_2 or NH_2 groups), and its metal salts and acid addition salts when Z_3 contains a basic group.

14. A pharmaceutical composition, comprising, in association with a pharmaceutically acceptable excipient, at least one compound according to claim **1**, or one of its non-toxic metal salts or addition salts with acids.

4,151,301

ORALLY ADMINISTERED COMPOSITION CONTAINING ORGANIC AMINE-ORGANIC ACID ADDITION SALT FOR REDUCING EXCESSIVE SECRETION OF SEBUM ON HUMAN SKIN AND SCALP

Gregoire Kalopissis, Paris, France, assignor to L'Oreal, Paris, France

Division of Ser. No. 534,804, Dec. 20, 1974, Pat. No. 4,002,671, which is a division of Ser. No. 203,038, Nov. 29, 1971, Pat. No. 3,879,560, which is a continuation-in-part of Ser. No. 801,840, Feb. 24, 1969, abandoned, Ser. No. 858,161, Sep. 15, 1969, Pat. No. 3,671,643, Ser. No. 12,122, Feb. 17, 1970, abandoned, and Ser. No. 36,405, May 11, 1970, abandoned, said Ser. No. 858,161, is a continuation-in-part of Ser. No. 801,840, said Ser. No. 817,193, Apr. 17, 1969, abandoned, and Ser. No. 736,960, Jun. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 427,976, Jan. 25, 1965, abandoned, and Ser. No. 602,480, Dec. 19, 1966, abandoned. This application Oct. 29, 1976, Ser. No. 737,192

Claims priority, application Luxembourg, Dec. 22, 1965, 50125; Feb. 23, 1968, 55553; Apr. 19, 1968, 55935; Feb. 19, 1969, 58042; May 12, 1969, 58634; Oct. 28, 1971, 64174

The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl.[2] **A61K** *31/205*

U.S. Cl. 424—316 **6 Claims**

1. A composition for oral administration to a human having a scalp or skin characterized by an excessive secretion of sebum to improve the condition thereof by reducing said excessive secretion of sebum comprising in admixture with a solid ingestible carrier from 0.75 to 20 weight percent of a non-toxic active compound selected from the group consisting of:

5-amino-3-thia hexanedioate of 2-benzylthio-ethylammonium,
5-acetamido-3-thia-hexanedioate of di-(2-benzyl-thioethylammonium),
5-amino-3-thia hexanedioate of 2-(3-alanylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-methylthioethylammonium,
5-amino-3-thia hexanedioate of 3-benzylthiopropylammonium,
2-amino-4-thia heptanedioate of 2-benzylthioethylammonium,
5-amino-3-thia hexanedioate of 2-(2,2-dimethoxyethylthio)-ethylammonium,
2-acetamido-3-benzylthio-propionate of 2-methylthioethylammonium,
5-benzamido-3-thia-hexanedioate of di(2-benzylthioethylammonium),
5-p-toluenesulfonamido-3-thia-hexanedioate of di(2-benzylthioethylammonium),
5-p-acetamidobenzenesulfonamido-3-thia-hexanedioate of di-(2-benzylthioethylammonium),
5-p-acetamidobenzamido-3-thia-hexanedioate of di(2-benzylthioethylammonium),
2-acetamido-4-thia-heptanedioate of di(2-methylthio-ethylammonium),
2-amino-4-thia decanedioate of 2-benzylthioethylammonium,
5-amino-3-thia hexanedioate of 2-benzylthiopropylammonium,
5-amino-3-thia hexanedioate of 2-benzylthio-2-methylpropylammonium,
5-amino-3-thia hexanedioate of 2-phenylthioethylammonium,
5-amino-3-thia hexanedioate of 2-t-butylthioethylammonium,
5-amino-3-thia hexanedioate of 2-tritylthioethylammonium,
5-amino-3-thia hexanedioate of 2-(2-butenylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(2-hydroxyethylthio)-ethylammonium,
5-amino-3-thia hexanedioate of 2-(2,3-dihydroxypropylthio) ethylammonium,
3-benzylthio-2-phenylacetamido propionate of 2-methylthioethylammonium,
2-acetamido-3-tritylthiopropionate of 2-methylthioethylammonium,
2-acetamido-3-benzhydrylthio propionate of 2-methylthioethylammonium,
5-amino-3-thia hexanedioate of 6-methanesulfonamido-6-ethoxy carbonyl-4-thia hexylammonium,
2-acetamido-4-thia-nonanedioate of 2,2′-thio bis (ethylammonium),
di-(β-benzylthioethylammonium) 5-p-acetamido-3-thiahexanedioate,
5-amino-3-thia acid hexanedioate of 2-octadecylthio ethylammonium,
2-amino-4-thia heptanedioate of 2-undecenylthio ethylammonium,
2-amino-4-thia nonanedioate of 2-(3-hydroxypropylthio) ethylammonium,
di-(5-amino-3-thia hexanedioate) of 3-thia-1,6-hexanediammonium,
2-amino-4-thia octanedioate of 2-(β-ureido ethylthio)ethylammonium,
5-amino-3-thia hexanedioate of 2-(3-methanesulfonamido propylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(p-phenylbenzylthio) ethylammonium,
5-tetradecanamido-3-thia hexanedioate of di(2-β-hydroxyethyl thio ethylammonium),
2-crotonamido-4-thia heptanedioate of di(2-tertiobutylthio ethylammonium),
2-butanesulfonamido-4-thia octanedioate of 2,2′-(2,3-dihydroxy-1,4-butanediyl dithio) diethylammonium,
2-formamido-3-(propyn-2-ylthio) propionate of 3-(1-naphthyl thio) propylammonium,
3-methylthio-2-trifluoroacetamido propionate of 2-oleylthio ethylammonium,
2-o-chlorobenzylthiomethyl-3-aza-4-oxo heptanedioate of 5,5′-sulfonyl bis (3-thia pentylammonium),
2-acetamido-3-p-methylthiophenylthio propionate of 2-(2,4,6-trimethyl benzylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(3,4-dichlorobenzylthio) ethylammonium,
2-butyramido-3-isopropylthio propionate of 2-(2,6-dichlorobenzylthio) ethylammonium,
2-acetamido-3-(3-alanylthio) propionate of 2-m-fluorobenzylthio ethylammonium,
6-amino-3-thia heptanedioate of 2-p-dimethylaminobenzylthio ethylammonium,
2-hexanamido-di-(p-methoxyphenyl)-3-methylthio propionate of 2-(2,3-dihydroxy propylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(o-chlorobenzylthio) ethylammonium,
5-amino-3-thia hexanedioate of 2-(p-bromobenzylthio) ethylammonium,
5-acetamido-3-thia hexanedioate of di-2-(2,4-dichlorobenzylthio) ethylammonium, and
2-acetamido-3-p-fluorobenzylthio propionate of 2-hexadecylthio ethylammonium.

4,151,302

ARALIPHATIC DIHALOGEN COMPOUNDS COMPOSITION AND METHOD OF USE

Joachim Gante; Hans-Adolf Kurmeier; Dieter Orth; Erich Schacht, and Albrecht Wild, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

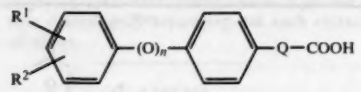
Division of Ser. No. 695,804, Jun. 14, 1976, Pat. No. 4,057,647. This application Aug. 19, 1977, Ser. No. 826,101

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528958

Int. Cl.[2] **A61K** *31/19, 31/235;* **C07C** *101/72, 65/02*

U.S. Cl. 424—317 **30 Claims**

1. An araliphatic dihalogen comound of the formula



wherein R^1 and R^2 are F, Cl or Br; Q is $-CH(CH_3)-CH_2-$, $-C(OH)(CH_3)-CH_2-$ or $-C(CH_3)=CH-$; and n is 0 or 1, and physiologically acceptable salts thereof.

28. A method of relieving inflammation in a patient afflicted therewith comprising administering to the patient an anti-inflammatorily effective amount of a compound of claim 1, in admixture with a pharmaceutically-acceptable carrier.

4,151,303
PHENOXYALKYLCARBOXYLIC ACID COMPOUNDS AND SERUM-LIPID AND TRIGLYCERIDE DEPRESSING THERAPEUTIC COMPOSITIONS

Ernst-Christian Witte; Hans P. Wolff, both of Mannheim, Fed. Rep. of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Fed. Rep. of Germany by Werner Plattner, executor; Wolfgang Schaumann, Heidelberg, and Karlheinz Stegmeier, Schriesheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

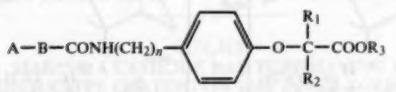
Filed Sep. 1, 1976, Ser. No. 719,878

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541342

Int. Cl.[2] C07C *101/42;* **A01N** *9/20*

U.S. Cl. 424—319 **28 Claims**

1. Phenoxyalkylcarboxylic acid compound of the formula



(I)

wherein

A is aryl, aryloxy, substituted aryl or substituted aryloxy, wherein said aryl is selected from phenyl and naphthyl and wherein the substituents are selected from lower alkyl, lower alkoxy, halogen and haloalkyl;

B is a straight-chained or branched, saturated or unsaturated hydrocarbyl containing up to 5 carbon atoms;

n is 1, 2 or 3 and

R_1, R_2 and R_3, which may be the same or different, are hydrogen or lower alkyl; and the pharmacologically compatible salts thereof.

4,151,304
METHOD AND COMPOSITION FOR MOISTURIZING THE SKIN

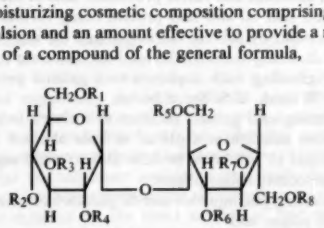
Anthony Evans, Teaneck, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,374

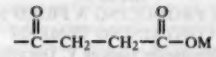
Int. Cl.[2] A61K *7/00, 7/40, 7/42, 7/44*

U.S. Cl. 424—361 **9 Claims**

1. A moisturizing cosmetic composition comprising a water-in-oil emulsion and an amount effective to provide a moisturizing effect of a compound of the general formula,



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8, each may be either hydrogen; or of the general formula,



wherein M is hydrogen, sodium or potassium; or mixtures thereof; and wherein the average degree of esterfication of said compound is at least about 62 mole percent.

4,151,305
STORAGE STABLE WATER-DILUTABLE EPOXY BASED COATING FOR METAL FOOD CONTACT SURFACES

Kenneth G. Davis, Ross Township, Allegheny County; George B. Dué, Pittsburgh, and Albert H. Lund, McCandless, all of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 736,984, Oct. 29, 1976, Pat. No. 4,105,614. This application May 15, 1978, Ser. No. 905,830

Int. Cl.[2] C08L *63/02*

U.S. Cl. 426—131 **7 Claims**

1. A metal substrate coated with a coating composition comprising a water solubilizable resin that comprises an adduct of a bisphenol and a diglycidyl ether of a bisphenol having an epoxy equivalent weight between about 180 and about 2500, using a molar ratio of bisphenol to diglycidyl ether between about 2:1 and about 9:8, further adducted with a polycarboxylic acid anhydride in an amount sufficient to provide an acid number between about 35 and about 150, and an aminoplast in a weight ratio between about 95:5 and about 60:40, solubilized with a volatile tertiary amine, ammonia, or ammonium hydroxide to a pH of about 7.0 to about 9.1 in a solvent or mixtures of solvents selected from the group consisting of alcohols, alkoxyethanols, ketones, and alkyl ethers of diethylene glycol, each present in between about one weight percent and about 20 weight percent of the weight of the final composition, and diluted with water to a solids content between about 10 weight percent and about 25 weight percent, wherein the volatile system, including amine, ammonia, or ammonium hydroxide, contains between about 65 and about 90 weight percent water and between about 35 and about 10 weight percent organic volatile solvents.

4,151,306
PROCESS FOR HYDROLYZING PROTEINACEOUS DERIVATIVES OF THE SKIN

Maurice A. Williams, 6378 Stonecrest, Brookpark, Ohio 44142; Robert E. Horn, 17499 Whitney Rd., #325, Strongsville, Ohio 44136, and John C. Bronikowski, 1434 S. Carpenter #104, Brunswick, Ohio 44212

Continuation-in-part of Ser. No. 739,527, Nov. 8, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,779

Int. Cl.[2] A23J *1/10*

U.S. Cl. 426—456 **7 Claims**

1. A process for treating raw keratinous materials, said process comprising the steps of

mechanically dewatering raw keratinous materials to reduce the moisture contents of the materials to a level sufficient to support the subsequent hydrolyzing step without excess moisture;

high shear extruding the keratinous materials to hydrolyze the protein while retaining the moisture in the materials during extruding by exerting a mechanical pressure on the materials is excess of the vapor pressure of the moisture in the materials; and

drying the material.

4,151,307
PROCESS FOR PRODUCING A FRIED SNACK FOOD CONTAINING TEMPEH

Mao H. Yueh, Minneapolis; George V. Daravingas, Edina; Fred J. Rigelhof, Minnetonka, and Herman W. Mueller, Minneapolis, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 2, 1974, Ser. No. 528,601
Int. Cl.[2] A23L 1/01
U.S. Cl. 426—549 **1 Claim**

1. In the process of preparing a fried snack product wherein a dough is prepared from a starch containing material selected from cereal flour, cereal starch, potato flour, potato starch and mixtures thereof wherein a portion of said starch containing material is a pregelatinized starch, the dough is shaped and then the shaped piece is deep fat fried, the improvement consisting of including tempeh in the dough in an amount of about 5 to 60% by weight based on the weight of the dough.

4,151,308
METHOD FOR PRODUCING A FAST MIXED AND MILLED CONCHABLE CANDY AND PRODUCT THEREOF

Salvatore F. Ziccarelli, Downers Grove, and Peter P. Noznick, Evanston, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed May 12, 1978, Ser. No. 905,530
Int. Cl.[2] A23G 1/00, 1/16
U.S. Cl. 426—613 **15 Claims**

1. In a method for producing a conched candy by initially mixing and milling the ingredients of at least sugar and fat on roller mills to form a paste and subsequently conching the paste to a smooth candy with developed flavor, the improvement wherein the mixing and milling of the ingredients is by high speed shearing and mixing wherein the ingredients are subjected to shearing forces having an average shear component of 75° or greater to produce an essentially mechanically generated mixing temperature of about 120° C. or less and to produce a paste mixture having an average particle size of the ingredient therein of less than 120 microns in a mixing time of less than 5 minutes.

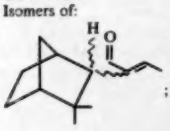
4,151,309
FLAVORING WITH SUBSTITUTED NORBORNANE DERIVATIVES

Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

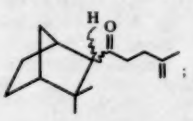
Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,132
Int. Cl.[2] A23L 1/226, 1/235
U.S. Cl. 426—538 **16 Claims**

1. A process for augmenting or enhancing the flavor or aroma of a foodstuff comprising adding to said foodstuff from about 0.5 ppm up to about 500 ppm based on the weight of the foodstuff of a norbornane derivative or mixture of norbornane derivatives having the structure or structures:

Mixture of Cis & Trans Isomers of:



Mixture of



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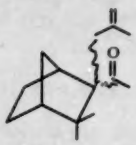
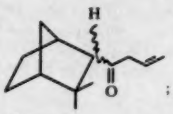
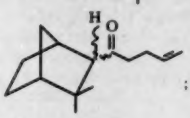
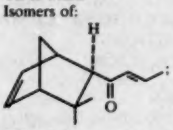


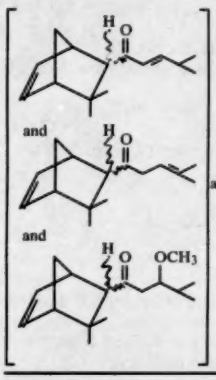




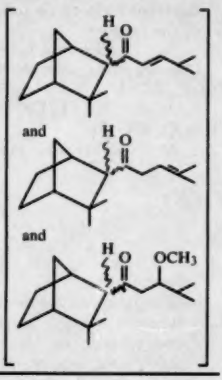
Mixture of Cis & Trans Isomers of:



Mixture of



Mixture of



4,151,310
SOYBEAN PROTEIN EXTRACT

Karl F. Mattil; Khee C. Rhee, both of Bryan, Tex., and Carl M. Cater, deceased, late of Bryan, Tex. (by Betty J. Cater, administratrix), assignors to The Andersons, Maumee, Ohio

Filed Jun. 7, 1977, Ser. No. 804,356
Int. Cl.[2] A23J 1/14
U.S. Cl. 426—656 **3 Claims**

1. A soybean protein extract containing at least 55 percent of soybean protein, on a dry solids basis, and from 2 to 32 percent of natural soybean oil, based on the weight of the protein, and the remainder of said extract consisting essentially of carbohydrates and minerals, and edible proteinate salts of the protein of said extract, said oil and said protein being further separable from each other by solvent extraction and having been jointly separated from soybeans by the method including the steps of:

(a) dry grinding such soybeans to a ground product finer than 70 mesh, U.S. Sieve Series;

(b) agitating said ground product as a slurry in an alkaline aqueous solution at a pH of at least about 8 for a time sufficient to solubilize protein and to yield aqueous, oil, and insoluble solids phases;

(c) separating said aqueous and oil phases from said insoluble solids phase; and

(d) either first centrifugally separating said aqueous phase from said oil phase and then lowering the pH of said aqueous phase to 4.0–5.0 to precipitate such protein ex-

tract, or first lowering the pH of said combined aqueous and oil phases to 4.0–5.0 to precipitate such protein extract and then centrifugally separating out such extract from said oil phase.

4,151,311

POST COLLOID ADDITION OF CATALYTIC PROMOTERS TO NON NOBLE METAL PRINCIPAL CATALYTIC COMPOUNDS IN ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 651,507, Jan. 22, 1976. This application Sep. 16, 1977, Ser. No. 833,905

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—53 28 Claims

1. A process for the catalytically rendering of a non-conductor surface receptive to electroless metal deposition comprising contacting said surface with a colloidal catalytic composition comprising the admixture of a principal catalytic agent wherein said principal catalytic agent is a compound of a metal selected from the groups of metals consisting of copper, nickel, cobalt, and iron and mixtures thereof and a catalytic promoter agent wherein said catalytic promoter agent is a compound of a metal selected from the group of metals consisting of Mg, Ca, Sr, Sc, Y, La, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc and Re and mixtures thereof and further said catalytic promoter is added subsequent to the colloidal nucleation process in which the principal catalytic agent is allowed to react as to yield a colloid, and further wherein the concentrations for the principal catalytic agent and the catalytic promoter agent are so adjusted as to yield a catalytic composition having a greater catalytic activity for electroless metal deposition in comparison to the same catalytic composition in the absence of said catalytic promoter agent.

4,151,312

MAKING A CATHODE RAY TUBE HAVING A CONDUCTIVE COATING ON THE INNER SURFACE WITH A SHARPLY DEFINED SMOOTH EDGE

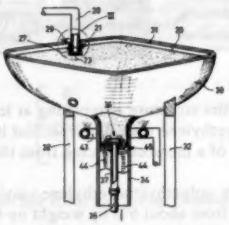
Johannes M. A. A. Compen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,371

Claims priority, application Netherlands, Sep. 1, 1975, 7510274

Int. Cl.[2] H01J *29/88;* B05D *5/12*

U.S. Cl. 427—64 17 Claims



1. A method for coating with an electrically conductive material the inner surface of a cathode ray tube bulb having a funnel portion with a cylindrical neck, said method comprising the steps of supporting the bulb with the neck downward, covering the inner surface of the bulb with a carrier liquid containing said conductive material, allowing said carrier liquid to drain downwardly and leave a residue of said conductive material on said inner surface of said bulb, drying said residue of said conductive material sufficiently to prevent said conductive material on the inner surface of said neck from flowing downwardly, and directing a stream of rinsing liquid along a circumferential line extending about the inner surface of said cylindrical neck, said rinsing liquid being directly outwardly and downwardly at an acute angle to the axis of said neck to strike the inner surface of said neck at an obtuse angle directed away from the coated surface area above said line to rinse away said conductive material from the inner surface of said neck below said line and leave a coating of said conductive material with a sharply defined smooth edge on the inner surface of said neck above said line.

4,151,313

METHOD FOR PRODUCTION OF PRINTED CIRCUITS BY ELECTROLESS METAL PLATING EMPLOYING A SOLID SOLUTION OF METAL OXIDES OF TITANIUM, NICKEL, AND ANTIMONY AS A MASKING MATERIAL

Motoyo Wajima; Mineo Kawamoto; Kanji Murakami; Hirosada Morishita, all of Hitachi, and Haruo Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1978, Ser. No. 884,568

Claims priority, application Japan, Mar. 11, 1977, 52-25975; Jun. 6, 1977, 52-65797

Int. Cl.[2] C23C *3/02;* H01B *5/14*

U.S. Cl. 427—98 7 Claims

1. A method for producing a printed circuit comprising the following steps:

(I) forming a plating resist on a negative pattern on circuit on a substrate with a masking material having an effect of reducing deposition and adhesion of a palladium initiator for electroless metal plating, and depositing a palladium initiator on an entire surface of substrate,

(II) removing the initiator on the resist, and

(III) dipping the substrate in an electroless metal plating solution, thereby forming electroless metal films on a positive pattern of the circuit, wherein an improvement comprises using a thermosetting resin containing a solid solution of oxides of titanium, nickel and antimony as the masking material in said step (I) and contacting the substrate with a hydrochloric acid solution of ammonium persulfate in said step (II) as a means for removing the initiator on the resist.

4,151,314

METHOD OF LINING CONTAINER CLOSURES

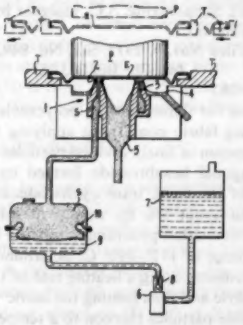
Michael Debenham, Frankston, Australia, assignor to The Broken Hill Proprietary Company, Limited, Melbourne, Australia

Division of Ser. No. 466,057, May 1, 1974, abandoned. This application Sep. 9, 1976, Ser. No. 721,854

Claims priority, application Australia, May 1, 1973, 3155/73

Int. Cl.[2] B05D *1/26;* B05C *7/00*

U.S. Cl. 427—239 7 Claims



1. A method of applying a substantially uniform amount of sealant to a container member comprising continuously supplying an amount of sealant in excess of that required to cover an area of the container member to an upward facing sealant

transfer face having at least two sides and a configuration corresponding to said area, removing said excess sealant from at least two sides of said transfer face to provide a substantially uniform amount of sealant available to be applied to said container member, and causing contact between said container member and said sealant on said transfer face to cover said area of said container member with the substantially uniform amount of sealant.

4,151,315

MANUFACTURE OF COATED SPLIT-RESISTANT IMPROVEMENT WEBS FROM PAPER HAVING UNIT WEIGHT 60 g/m²

Jürgen Fock, Düsseldorf, and Helmut Bühler, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,752

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727312

Int. Cl.² B05D *1/38, 3/02*

U.S. Cl. 427—258 **5 Claims**

1. In a method for the manufacture of split-resistant improvement webs wherein a thin paper having a weight per unit area of $\leqq 60$ g/m² is coated with a hardenable synthetic resin after decorative printing, dried, and hardened, the improvement which comprises, prior to decorative printing, applying a solution or dispersion of a hardenable impregnating resin to the side of the paper to be decorated using a metered roller application, the amount of said impregnating resin being between at least about 8% of the weight of the paper based on the solids content of the resin, and that amount of resin to assure that the resin does not penetrate through to the reverse side of the paper, and then drying the impregnated paper.

4,151,316

FLAMEPROOFING OF POLYESTER FABRICS USING BROMINATED CYCLOALKANES

Rene A. Eckert, Simpsonville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Nov. 9, 1977, Ser. No. 849,527

Int. Cl.² B05D *3/02*

U.S. Cl. 427—381 **5 Claims**

1. A process for flameproofing polyethylene terephthalate fiber-containing fabric comprising applying to said fabric an aqueous suspension of finely divided particles consisting essentially of octagonal hexabromide formed by the incomplete bromination of cis, trans, trans cyclododecatriene containing not more than about 5% by weight of other isomers, said incomplete bromination providing a mixture having a melting point in the range of 177°–191° C. determined by differential scanning colorimetry using a heating rate of 10° C. per minute, drying said fabric and then heating the fabric with said octagonal hexabromide particles thereon to a temperature above the melting point of the mixture, but not in excess of about 200° C. for about 30 seconds, whereby the hexabromide particles diffuse into the fibers of the fabric to maximize fire resistance while fixing the particles to the fabric with minimum damage to the fabric.

4,151,317

POLYVINYL CHLORIDE PLASTISOLS AND METHOD OF COATING METAL THEREWITH

Christian Burba, Herbern; Hans-Guenter Volland, Unna, and Norbert Esper, Bergkamen, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 843483, Oct. 19, 1977, abandoned, which is a continuation of Ser. No. 667,995, Mar. 18, 1976, abandoned. This application Apr. 11, 1978, Ser. No. 895,481

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1975, 2512366

Int. Cl.² B05D *3/02*

U.S. Cl. 427—388 D **10 Claims**

1. In a method for protectively coating metal which comprises applying to said metal a coating of a polyvinyl chloride plastisol containing an adhesion improver and then baking the coating at a temperature from about 120° C. to about 200° C., the improvement wherein said adhesion improver is from about 0.1 to about 4.0 percent, by weight of the plastisol, of an adduct formed between substantially equivalent amounts of

(A) a ketimine containing from about 0.1 to about 1.4 azomethine groups per 100 grams of the compound; and

(B) an isocyanate.

4,151,318

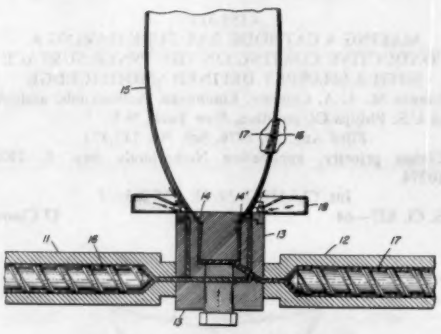
LAMINAR THERMOPLASTIC FILM CONSTRUCTIONS

Jeffrey D. Marshall, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,388

Int. Cl.² B65D *31/00, 77/00;* **B32B** *27/08*

U.S. Cl. 428—35 **2 Claims**



1. A laminar film structure comprising at least one layer of low density polyethylene resin and a second layer comprising a resinous blend of a member selected from the group consisting of:

(a) high density polyethylene, ethylene vinyl acetate copolymer having from about 6% by weight up to about 18% by weight of vinyl acetate and low density polyethylene;

(b) high density polyethylene-octene copolymer and low density polyethylene; or

(c) high density polyethylene and a non-saponified ethylene vinyl acetate copolymer having a vinyl acetate content of from about 6% by weight up to about 18% by weight.

2. A laminar thermoplastic bag structure comprising at least two layers, an inner layer and an outer layer, said inner layer comprising low density polyethylene and said outer layer comprising a film formed from a resinous blend of a member selected from the group consisting of:

(a) high density polyethylene, ethylene vinyl acetate copolymer having from about 6% by weight up to about 18% by weight of vinyl acetate and low density polyethylene;

(b) high density polyethylene-octene copolymer and low density polyethylene; or

(c) high density polyethylene and a non-saponified ethylene vinyl acetate copolymer having a vinyl acetate content of from about 6% by weight up to about 18% by weight.

4,151,319

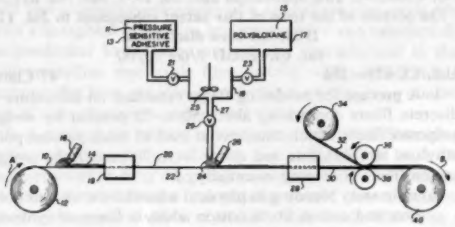
METHOD FOR MAKING A PRESSURE SENSITIVE ADHESIVE COATED LAMINATE

Martin M. Sackoff, Glens Falls; John R. Smith, Gansevoort, both of N.Y., and Billy E. Walling, Martinez, Ga., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 690,152, May 26, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,750

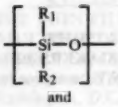
Int. Cl.[2] B32B *7/06*

U.S. Cl. 428—40 **81 Claims**



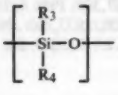
1. A method for making a laminate comprising coating a first sheet having a release surface thereon with a modified pressure sensitive adhesive to form a first laminate, subjecting said first laminate to conditions suitable to dry or cure the pressure sensitive adhesive, and marrying the pressure sensitive adhesive side of the thus treated first laminate to the inner surface of a facing layer having inner and outer surfaces; said modified pressure sensitive adhesive comprising a pressure sensitive adhesive and means for decreasing the "zero minute peel value" of the facing layer-pressure sensitive adhesive layer combination, said means comprising a polysiloxane intimately mixed with the pressure sensitive adhesive, said polysiloxane being formed from monomeric units having structures (I) and (II) as follows:

(I)



and

(II)



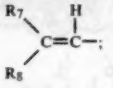
wherein R_1 is selected from the group consisting of:

(i) phenyl;

(ii) methyl;

(iii) tolyl;

(iv)



wherein R_7 and R_8 may be the same or different and may be hydrogen, methyl, or ethyl, and wherein when R_1 is group (i), (ii), (iii) or (iv), the prime mole percent of structure (I) is from about 0.5 to 50 and the prime mole percent of structure (II) is from about 99.5 to 50, and

(v) polyoxyalkylene having the structural formula

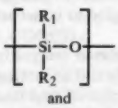
$$-R_5(OC_2H_4)_n(OC_3H_6)_mOR_6$$

wherein R_6 is hydrogen or a monovalent hydrocarbon group having from 1 to 10 carbon atoms, R_5 is an alkylene group having at least two carbon atoms, n and m are zero or numbers, the sum of n and m is at least 1 and the oxyalkylene unit $R_6O(C_3H_6O)_m(C_2H_4O)_n$, has a molecular weight of at least about 80, and wherein there are at least two units having structure (I) and at least three units having structure (II) and wherein the oxyalkylene unit constitutes from about 85 to 30 weight percent of the polysiloxane polymer;

R_2 may be methyl, ethyl, or phenyl; and R_3, and R_4 may be the same or different and may be methyl or ethyl.

60. A pressure sensitive adhesive composition comprising a mixture of a pressure sensitive adhesive and a polysiloxane, said polysiloxane being formed from monomeric units having structures (I) and (II) as follows:

(I)



and

(II)

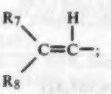
wherein R_1 is selected from the group consisting of:

(i) phenyl;

(ii) methyl;

(iii) tolyl;

(iv)



wherein R_7 and R_8 may be the same or different and may be hydrogen, methyl, or ethyl, and wherein when R_1 is group (i), (ii), (iii) or (iv), the prime mole percent of structure (I) is from about 0.5 to 50 and the prime mole percent of structure (II) is from about 99.5 to 50, and

(v) polyoxyalkylene having the structural formula

$$-R_5(OC_2H_4)_n(OC_3H_6)_mOR_6$$

wherein R_6 is hydrogen or a monovalent hydrocarbon group having from 1 to 10 carbon atoms, R_5 is an alkylene group having at least two carbon atoms, In and m are zero or numbers, the sum of n and m is at least **1** and the oxyalkylene unit $R_6O(C_3H_6O)_m(C_2H_4O)_n$, has a molecular weight of at least about 80, and wherein there are at least two units having structure (I) and at least three units having structure (II) and wherein the oxyalkylene unit constitutes from about 85 to 30 weight percent of the polysiloxane polymer; R_2 may be methyl, ethyl, or phenyl; and R_3, and R_4 may be the same or different and may be methyl or ethyl.

4,151,320
FLEXIBLE NON-SKID STRIP WITH UPWARDLY PROJECTING PORTION FOR STAIR EDGE

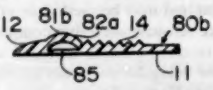
Hiromitsu Naka, No. 39, Oaza Shinmachi, Yashio-shi, Saitama-ken, Japan

Continuation of Ser. No. 692,019, Jun. 1, 1976, abandoned, which is a division of Ser. No. 483,005, Jun. 25, 1974, abandoned. This application Dec. 1, 1977, Ser. No. 856,802

Claims priority, application Japan, Jul. 6, 1973, 48-79785[U]; Jul. 6, 1973, 48-79786[U]; Jul. 6, 1973, 48-79787[U]; Aug. 11, 1973, 48-94004[U]; Aug. 17, 1973, 48-96158[U]; Oct. 24, 1973, 48-122792[U]

Int. Cl.² B32B *3/30*

U.S. Cl. 428—163 **3 Claims**



1. A flexible non-skid strip comprising:

a main body portion extending along the length of said strip and adapted to be secured to the tread portion of a stair;

a forward edge anchoring portion co-extending with said main body portion parallel to and spaced from said main body portion and adapted to be secured to the riser of said stair;

a connection portion formed integrally with and interconnecting said main body and anchoring portions adapted to bend about the stair edge of said stair including

an arcuate upper portion projected above the upper surfaces of said main body and anchoring portions and having a thickness smaller than that of the main body and anchoring portions connected thereby,

a cavity between the main body and anchoring portions underneath the arcuate upper portion and extending along the length of said connection portion, and

a sheet-like flexible cross-piece formed integrally with the opposite lower edges of the main body and anchoring portions so as to close the bottom of said cavity and having a thickness smaller than that of the main body and anchoring portions;

said main body, anchoring and connection portions being formed of extrudable flexible thermoplastic synthetic resins; and

a non-skid top surface portion on the upper surface of said main body portion.

4,151,321
HIGH RESOLUTION RECORDING MEDIUM AND METHOD FOR PRODUCING SAME

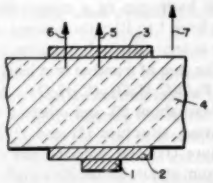
Leopold Hiesinger, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,941

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658623

Int. Cl.² G03C *5/02, 5/04, 5/06;* **B32B** *3/00*

U.S. Cl. 428—195 **22 Claims**



1. A high resolution recording medium comprising:

first and second patterned reflecting layers; and

a spacer layer interposed between the first and second reflecting layers, said first and second reflecting layers cooperating with said spacer layer to form a high resolution, patterned interference filter for recording a color pattern, wherein the thickness of the spacer layer is one factor determining the color recorded in the medium.

4,151,322
PRODUCTION OF FLAME RETARDANT FIBER BLEND HAVING DESIRABLE TEXTILE PROPERTIES COMPRISING POLYESTER AND COTTON FIBERS

Arnold J. Rosenthal, Whippany; Alex S. Forschirm, Lake Hiawatha, both of N.J., and Bruce P. Barnes, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 470,420, May 16, 1974, Pat. No. 4,035,542. This application Jun. 30, 1977, Ser. No. 811,743

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.² D03D *1/00, 25/00*

U.S. Cl. 428—254 **47 Claims**

1. A process for rendering flame retardant an admixture of discrete fibers comprising about 50 to 70 percent by weight polyester fibers which comprise at least 85 mole percent polyethylene terephthalate and about 30 to 50 percent by weight cotton fibers consisting essentially of

(a) intimately blending in physical admixture with said polyester and cotton fibers cotton additive fibers of synthetic aromatic polyester polymer containing chlorine, bromine, or mixtures thereof chemically bound to an aromatic ring having a chlorine and/or bromine content of about 25 to 60 percent by weight based upon the weight of said aromatic polymer in a quantity of about 10 to 40 percent by weight based upon the total weight of said fibers of polyester, cotton and synthetic aromatic polyester polymer, with said fibers of synthetic aromatic polymer being substantially free of an oxide of antimony, and

(b) applying a topical application of an organophosphorus flame retardant to said resulting fiber blend in a minor concentration of about 2 to 20 percent by weight based upon the total weight of the fibers of polyester, cotton, and synthetic aromatic polymer wherein said fibers are rendered non-burning when subjected to a methane diffusion flame at ambient conditions and exhibit desirable textile properties.

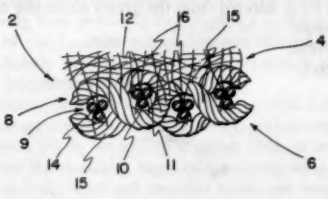
4,151,323
PAPERMAKERS BELT

Donald R. Christie, Troy, N.Y., assignor to Huyck Corporation, Wake Forest, N.C.

Continuation of Ser. No. 547,309, Feb. 5, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,324

Int. Cl.² B32B *5/06*

U.S. Cl. 428—235 **11 Claims**



1. A multilayered papermakers' belt which comprises a substantially resin-free fibrous surface layer which is joined by needling to the top side of a fibrous base layer having a top side and bottom side and in which the fibers of said base layer are substantially entirely encapsulated with resin and in which the

portions of the surface layer fibers in contact with said base layer are substantially entirely encapsulated with resin.

4,151,324

PIEZOELECTRIC CRYSTALLINE FILMS AND METHOD OF PREFARING THE SAME

Toshio Ogawa, Nagaokakyo; Hiroshi Nishiyama, Mukou, and Tasuku Mashio, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,821

Claims priority, application Japan, Mar. 16, 1977, 52-29497; Sep. 9, 1977, 52-109256; Sep. 9, 1977, 52-109257; Sep. 9, 1977, 52-109258

Int. Cl.[2] **C23C** *13/00;* **C04B** *35/00*

U.S. Cl. 428—432 **8 Claims**

1. A piezoelectric crystalline film disposed on a substrate, said film consisting essentially of a crystalline zinc oxide film with a hexagonal crystalline structure and a c-axis substantially perpendicular to the substrate surface, characterized in that said crystalline zinc oxide film contains 0.01 to 20.0 atomic percent of at least one element selected from the group consisting of iron, chromium, cobalt and nickel.

8. A method for making piezoelectric crystalline films comprising simultaneously sputtering zinc oxide and at least one element selected from the group consisting of iron, chromium, cobalt and nickel from a film material source onto a metal or glass substrate to form a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the substrate surface, said zinc oxide containing 0.01 to 20.0 atomic percent of at least one of said elements, wherein said sputtering is effected by radio-frequency sputtering in an atomosphere of argon or oxygen, or a mixture of argon and oxygen under a pressure of 1×10^{-1} to 1×10^{-3} Torr, and wherein said film material source consists essentially of a ceramic of zinc oxide containing at least one of said elements, said substrate being positioned on an anode placed in parallel with a cathode on which said film material source is positioned, said film material source being supplied with an electric power of 2 to 8 w/cm^2 and said substrate being maintained at a temperature of 200° to 500° C. during sputtering.

4,151,325

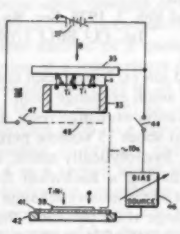
TITANIUM NITRIDE THIN FILMS FOR MINIMIZING MULTIPACTORING

Kimo M. Welch, Mountain View, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 565,019, Apr. 3, 1975, Pat. No. 4,006,073. This application Oct. 22, 1976, Ser. No. 734,841

Int. Cl.[2] **H01J** *43/28*

U.S. Cl. 428—432 **4 Claims**



1. A microwave circuit component having a thin film coating of titanium nitride on the surface thereof to reduce multipactoring in operation of the component.

4,151,326

HOLDING PLATE FOR LIQUID CRYSTAL

Fumiaki Funada, Yamatokoriyama, and Hiroshi Kuwagaki, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

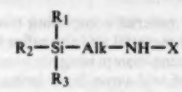
Filed Aug. 9, 1976, Ser. No. 712,647

Claims priority, application Japan, Aug. 9, 1975, 50-96823

Int. Cl.[2] **C09K** *3/34;* **B32B** *17/10;* **G02F** *1/16*

U.S. Cl. 428—447 **2 Claims**

1. A holding plate for a liquid cyrstal which is adapted to arrange the molecules of the liquid crystal in a substantially horizontal, homogeneous orientation, said holding plate having an electrode provided on the side thereof which contacts the liquid crystal, said holding plate being coated with a film consisting of a silane compound formed by the application of an aqueous solution of a precursor compound of the formula:



wherein R_1, R_2, and R_3 are each CH_3—, CH_3O—, C_2H_5O—, C_3H_7O—, or halogen but at least one of them is CH_3—, CH_3O—, or C_2H_5O—, Alk is $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CH_2CH_2CH_2-$, or $-CH_2CH_2CH_2CH_2CH_2-$, and X is the residue of a polyamine group consisting of $-NH(CH_2)_2NHCH_2COOCH_3$, $-NH(CH_2)_2-NHCH_2COOC_2H_5$ $-NH(CH_2)_3NHCH_2COOCH_3$, $-NH(CH_2)_3NHCH_2CH_2COOCH_3$, $-NH(CH_2)_2NHCH_2CH_2COOCH_3$, $-NH(CH_2)_3NHCH_2CH_2COOC_2H_5$, $-NH(CH_2)_2NHCH_2CH_2CH_2COOC_2H_5$, $-NH(CH_2CH_2NH)_2H$, or $-NH(CH_2CH_2CH_2NH)_2H$, wherein the precursor compound is dissolved into water to make a concentration of 0.001 to 0.1% by weight, said silane compound being disposed between the electrode and the liquid crystal, the film consisting of the silane compound being provided on the electrode by dipping the holding plate in the aqueous solution, drying the same, and subjecting the holding plate to rubbing to orient the molecular arrangement of the liquid crystal in one direction.

4,151,327

COMPLEX AMINE/SILANE TREATED CELLULOSIC MATERIALS

William R. Lawton, 6651 Jewitt-Holmwood Rd., Orchard Park, Erie County, N.Y. 14127

Filed Feb. 24, 1978, Ser. No. 880,773

Int. Cl.[2] **B05D** *3/02;* **B32B** *9/04*

U.S. Cl. 428—447 **10 Claims**

1. The method of modifying the physical and chemical properties of cellulosic products such as paper, cotton cloth, wood and fiberboard to impart oil and water repellency to such products, to control the degree of transparency and opacity of such products, to render such products adhesive, and to enhance the dimensional stability thereof,

said method comprising:

forming an amine/silane complex within the fibers of and as a coating for said cellulosic products, and including the steps of:

impregnating a cellulosic material with an organic base to distribute said base throughout said material,

treating the base-containing cellulosic material with a halosilane to effect a chemical reaction between said organic base and said halosilane to form, in situ, within fibers of said cellulosic material and on the surface thereof a reaction complex of said organic base and said halosilane,

said complex constituting in integral element of said cellulosic material permanently modifying the properties thereof.

7. A cellulosic product containing as an integral, in-situ-formed element thereof distributed therethrough an amine/si-

lane complex, said complex constituting a reaction product of an organic base and a halosilane.

4,151,328

SELF-WELDING LAMINATE COMPOSITIONS

Jack M. Kight, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Jan. 9, 1978, Ser. No. 867,745
Int. Cl.[2] B32B 27/06
U.S. Cl. 428—483 7 Claims

PLASTICIZED SARAN
TERPOLYMER

1. In a packaging material comprising two layers, one layer being a self adherent material and the other layer being a saran layer, the improvement, comprising:

the combination of said saran layer being plasticized with a sufficient amount of polyester to plasticize said saran, said polyester having a molecular weight between 1,000 and 10,000, said polyester being the product of an equimolar esterification reaction between adipic acid, azelaic acid or sebacic acid and propylene glycol, 1,3-butane diol, 1,4-butane diol or neopentyl glycol wherein the end group of the polyester is hydroxyl, carboxyl or esterified by aliphatic (C1 to C18), alicyclic aliphatic, heterocyclic or aromatic monocarboxylic acids or monoalcohols; and

said self-adhering layer being a terpolymer of ethylene, a vinyl ester, and an alkenoic acid, with at least 60 weight percent ethylene, 20 to 40 weight percent vinyl ester and 0.1 to 10 weight alkenoic acid.

4,151,329

Nb_3Ge SUPERCONDUCTIVE FILMS

Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 816,481, Jul. 18, 1977, Pat. No. 4,128,121. This application Mar. 6, 1978, Ser. No. 883,718
Int. Cl.[2] H01L 39/12
U.S. Cl. 428—607 5 Claims

1. A superconductive continuous film of Nb_3Ge having a surface area of at least one square centimeter ranging in composition up to about 2 atomic % from stoichiometric composition having a critical temperature T_c of at least about 20 degrees Kelvin, said critical temperature T_c being the temperature at which said film becomes 50% superconducting in that it has one half of its normal conductor resistance existing at three degrees Kelvin above T_c, said film having a transition width of less than one degree Kelvin extending from the temperature in degrees Kelvin at which said film becomes 10% superconducting in that it has 90% of its normal conductor resistance existing at three degrees Kelvin above T_c to the temperature in degrees Kelvin at which said film becomes 90% superconducting in that it has 10% of its normal conductor resistance existing at three degrees Kelvin above T_c.

4,151,330

Mb_3Ge SUPERCONDUCTIVE FILMS GROWN WITH NITROGEN

Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 816,483, Jul. 18, 1977, Pat. No. 4,129,167. This application Mar. 6, 1978, Ser. No. 883,719
Int. Cl.[2] H01L 39/12
U.S. Cl. 428—607 6 Claims

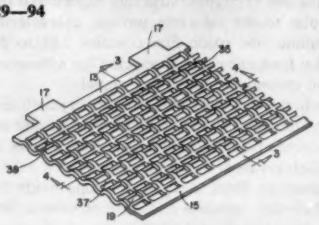
1. A superconductive continuous film of Nb_3Ge having a surface area of at least one square centimeter ranging in composition up to about 2 atomic % from stoichiometric composition having a critical temperature T_c of at least 17.5 degrees Kelvin, said critical temperature T_c being the temperature at which said film becomes 50% superconducting in that it has one half of its normal conductor resistance existing at three degrees Kelvin above T_c, said film having a transition width of less than one degree Kelvin extending from the temperature in degrees Kelvin at which said film becomes 10% superconducting in that it has 90% of its normal conductor resistance existing at three degrees Kelvin above T_c to the temperature in degrees Kelvin at which said film becomes 90% superconducting in that it has 10% of its normal conductor resistance existing at three degrees Kelvin above T_c.

4,151,331

OFFSET PERFORATED LEAD-ACID BATTERY GRID

Leonard F. Hug, Wheatridge; Toshio Uba, Denver, both of Colo.; Charles Frazier, and John F. Varga, both of Harbert, Mich., assignors to The Gates Rubber Company, Denver, Colo.

Filed Feb. 23, 1978, Ser. No. 880,419
Int. Cl.[2] H01M 4/14, 10/06
U.S. Cl. 429—94 18 Claims



1. In a generally planar flat sheet lead grid having perforation(s) openings therein completely penetrating the sheet as viewed perpendicularly to the plane of the sheet and bounded by integrally interconnected continuous strands of lead of lesser width than the perforation openings and lying in the plane of and defining opposed principal faces of the grid, the improvement comprising: a first portion of said strands being offset and projecting from one of the opposed principal faces of the grid; and a second portion of said strands disposed adjacent to said first portion and being offset and projecting from the other of the opposed principal faces of the grid, thereby defining a grid of increased apparent thickness, said integrally interconnected strands forming the outer surfaces of the grid.

4,151,332

INERT INTERFACE BEADS OF A CROSSLINKED COPOLYMER OF METHYL METHACRYLATE AND HYDROXYALKYL METHACRYLATE FOR REGENERATION OF MIXED BED ION EXCHANGE COLUMNS

Berni P. Chong, Willow Grove, and Robert R. Rowe, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 2, 1978, Ser. No. 874,711
Int. Cl.[2] B01J 1/09
U.S. Cl. 521—28 6 Claims

1. A mixed-bed ion exchange resin composition comprising:

particles of an anion exchange resin,

particles of a cation exchange resin, and

from about 5 to about 15 volume percent of spherical, non-aggregating, hydrolytically stable, ionically neutral polymer beads having a backwash flow rate intermediate between that of the anion exchange resin particles and the cation exchange resin particles, the beads being derived from a copolymer of from about 51 to about 94 weight percent methyl methacrylate from about 5 to about 35 weight percent hydroxyalkyl methacrylate, the alkyl group having from two to six carbon atoms, and from about 0.5 to about 12 weight percent of ionically neutral,

hydrolytically stable, polyethylenically unsaturated cross-linker.

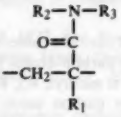
4,151,333

CELL REGULATORS IN STRUCTURAL FOAMS

Gerd M. Lenke, Swarthmore; Elwood E. Huntzinger, Springfield, and Dewey G. Holland, Chadds Ford, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 1, 1977, Ser. No. 820,576
Int. Cl.[2] C08J 9/10
U.S. Cl. 521—95 19 Claims

1. In the preparation of structural foams from foamable polyphenylene oxide resins, the method of improving the cellulose structure of such foams which comprises incorporating into the resin composition prior to blowing thereof 0.5 to 5 parts per hundred parts by weight of said resin composition of a cell regulating additive comprising an acrylamide polymer containing at least 80% of the moiety of the formula



wherein R_1 is H or an alkyl group of 1 to 4 carbon atoms wherein R_2 and R_3 are independently selected from the group consisting of H, hydrocarbyl of 1 to 20 carbon atoms and oxygenated hydrocarbyl radicals; provided that when R_2 is other than H or a linear alkyl of 1 to 10 carbon atoms, R_3 must be H.

4,151,334

PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS EMPLOYING QUATERNARY BORON SALTS AS CATALYSTS

Peter T. Kan, Plymouth, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 752,461, Dec. 20, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,794
Int. Cl.[2] C08G 18/14
U.S. Cl. 521—105 14 Claims

1. A process for the preparation of foams characterized by carbodiimide and isocyanurate linkages comprising catalytically condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a quaternary boron salt prepared by the reaction at a temperature of from 25° C. to 200° C. for a period of one half hour to 24 hours of (a) boric acid or an alkyl ester thereof with (b) an organic compound having a reactive hydrogen atom on a nitrogen atom selected from the group consisting of primary and secondary alkyl amines having from 1 to 4 carbon atoms in the alkyl chain, alkylenediamines, polyalkylene polyamines and primary and secondary alkanclamines having from 2 to 4 carbon atoms in the alkanol chain or mixtures of the above organic compounds with an alcohol having from 1 to 6 carbon atoms and from 1 to 3 hydroxyl groups or a phenol having from 6 to 20 carbon atoms and from 1 to 3 hydroxyl groups, and (c) an alkali metal, alkali metal oxide or an alkali metal hydroxide employing a mole ratio of (a):(b):(c) of from 1:2:1 to 1:4:1.

4,151,335

UNSATURATED POLYESTER RESIN CAPABLE OF ENTRAPPING AN INERT GAS TO FORM A STRUCTURAL FOAM

Ennio Cozzi, Cantalupo, and Massimo Tardani, Busto Arsizio, both of Italy, assignors to Snia Viscosa S.p.A. Societa Nazionale Industria Applicazioni Viscosa, Milan, Italy

Filed Oct. 3, 1977, Ser. No. 838,668
Claims priority, application Italy, Oct. 5, 1976, 28001 A/76
Int. Cl.[2] C08J 9/30
U.S. Cl. 521—138 5 Claims

1. An unsaturated polyester resin capable of entrapping air or other inert gases therein to form a structural foam, wherein the resin is formed by the polymerization of a mixture of (a) an unsaturated polyester obtained from the polycondensation of at least one α,β-ethylenically unsaturated dicarboxylic acid and a polyvalent alcohol (b) at least one ethylenically unsaturated monomer copolymerizable therewith and (c) ϵ-caprolactam, said resin containing, in its polymeric chain, 0.1 to 20 mol% of amide and/or amine groups and having an acidity number between 5 and 90 mg. of KOH/g. of resin and a molecular weight between 500 and 5000.

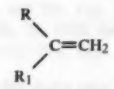
4,151,336

PROCESS FOR THE PRODUCTION OF A SUBSTANTIALLY EQUIMOLECULAR COPOLYMER OF MALEIC ACID ANHYDRIDE AND DIISOBUTYLENE

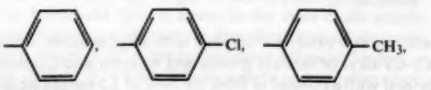
Günter Sackmann; Günter Kolb, both of Leverkusen; Heinz Fischer, Pulheim, and Friedhelm Müller, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,043
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701760
Int. Cl.[2] C08F 6/06, 6/24, 8/14, 222/06
U.S. Cl. 526—15 6 Claims

1. A process for producing a substantially equimolecular copolymer of maleic acid anhydride and diisobutylene which comprises the steps of initiating solution or suspension copolymerization of maleic acid anhydride and diisobutylene and shortly before or after conclusion of said copolymerization introducing at least one additional monomer into the resulting polymerization mixture in an amount of from 1 to 12 mol %, based on the amount of maleic acid anhydride subjected to copolymerization, and maintaining resulting monomer containing polymerization mixture at a temperature of from 30° to 200° C. in the presence of a free radical initiator until the unreacted maleic acid anhydride content of said mixture has been reduced, said at least one monomer being of the formula



wherein R is hydrogen, $-CH_3$, $-C_2H_5$, $-OR_2$, $-O-CO-CH_3$,



$-CH_2OH$ or $-CH_2O-CO-CH_3$; R_1 is hydrogen or $-CH_3$ and R_2 is alkyl having from 1 to 4 carbon atoms.

4,151,337

PROCESS FOR PREPARING POLYOLEFIN

Natsuki Kanoh, Sagamihara; Toru Tanaka, Komae, and Nobuo Enokido, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,177

Claims priority, application Japan, Aug. 17, 1976, 51-98103

Int. Cl.[2] C08F *4/66, 10/02*

U.S. Cl. 526—116 13 Claims

1. A process for preparing a polyolefin which comprises polymerizing an olefin by using a catalyst system combining an auxiliary catalytic component of an organoaluminum compound and a solid catalytic component obtained by reacting a mixture of a vanadium trichloride ether complex and a titanium trichloride ether complex with an aluminum halide and/or a boron halide in a solvent in which the resultant ether complex of said aluminum halide and/or said boron halide is soluble and said solid catalytic component is insoluble, and separating the resultant precipitate containing said solid catalytic component; wherein the olefin is ethylene or a mixture of ethylene and an α-olefin comonomer having from 3 to 12 carbon atoms, in a ratio such that the resulting copolymer contains less than 10 wt. % of said comonomer units; and wherein the molar ratio of the vanadium trichloride ether complex to the titanium trichloride ether complex is in the range of 0.001 to 3,000.

4,151,338

METHOD FOR THE PREPARATION OF HIGH MELTING C_4-HYDROCARBON RESINS

Günter Hasser; Werner Hübel, both of Herne; Werner Nagengast, Recklinghausen; Josef Disteldorf, and Horst Schnurbusch, both of Herne, all of Fed. Rep. of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,019

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716877

Int. Cl.[2] C08F *4/52, 236/06*

U.S. Cl. 526—185 9 Claims

1. A method for the preparation of high-melting resins with a melting range of 85°–120° C. which consists essentially of polymerizing a butadiene-rich C_4-cut of C_4-olefins with a liquified protonated Friedel-Crafts catalyst of the formula

$$AlX_nR_m \cdot HX$$

wherein:

X = Cl, Br, I;

R = C_1–C_4 alkyl or isoalkyl group;

n = 1–3;

m = 2–0;

wherein said catalyst is liquified with alkylbenzenes containing C_1–C_4 alkyl or isoalkyl groups and wherein said C_4-olefin cut is used with a content of from 50–70% of 1,3-butadiene and the polymerization takes place at 35°–80° C.; wherein said polymerization is carried out in the presence of less than 2.0% C_5 olefins.

4,151,339

PERESTER-ACYL SULFONYL PEROXIDE CO-INITIATOR FOR VINYL POLYMERIZATION

Ronald L. Friedman, San Rafael, and Roger N. Lewis, Martinez, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

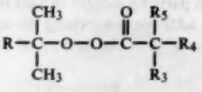
Continuation-in-part of Ser. No. 508,475, Sep. 23, 1974, abandoned. This application Nov. 1, 1974, Ser. No. 520,072

The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.

Int. Cl.[2] C08F *4/38, 114/06, 218/08, 4/36*

U.S. Cl. 526—204 13 Claims

1. In a process for polymerizing vinyl chloride, and for copolymerizing vinyl chloride and up to 30 percent by weight of comonomers in aqueous suspension by heating to a temperature of 30°–90° C. under a pressure of up to 15 atmospheres in the presence of peroxide initiator, the improvement wherein said initiator is a mixture of an acyl sulfonyl peroxide and a perester of the formula



wherein R_3, R_4, and R_5 are the same or different alkyl groups of from 1 to about 10 carbon atoms provided not more than one of R_3, R_4, and R_5 is methyl, R_3, R_4, and R_5 together with the associated tertiary carbon atom and adjacent carbonyl group form a neodecanoate group and R is straight chain alkyl of 2–5 carbon atoms, in which the molar proportion between the acyl sulfonyl peroxide and perester is 3:1 to 1:5, and in which the acyl sulfonyl peroxide and perester are about 0.003–0.2 percent by weight of the monomers.

4,151,340

PROCESS FOR PRODUCING FLUOROCOPOLYMER

Masahiko Ichimura; Haruhisa Miyake; Shun-ichi Kodama, and Michio Hisasue, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,098

Claims priority, application Japan, Feb. 1, 1977, 52-9259

Int. Cl.[2] C08F *214/24, 214/26*

U.S. Cl. 526—249 4 Claims

1. A fluorocopolymer having high rigidity, and being solvent soluble which comprises

25 to 65 mole percent of a component of a fluoroolefin monomer selected from the group consisting of tetrafluoroethylene and chlorotrifluoroethylene;

75 to 35 mole percent of a component of a cyclohexylvinyl ether monomer; or a mixture of cyclohexylvinyl ether monomer and

a comonomer selected from the group consisting of olefin, halo olefin, unsaturated carboxylic acid ester, vinyl carboxylate and alkyl vinyl ether monomers; wherein said component of said comonomer is present in an amount less than 30 mole percent of the total amount of said fluoroolefin and said cyclohexyl vinyl ether monomers.

4,151,341

NOVEL POLYMERS AND POLYMERIC SALTS

Robert H. Lalk, and Syamalarao Evani, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

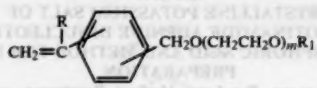
Filed Apr. 5, 1978, Ser. No. 893,645

Int. Cl.[2] C08F *212/04, 216/14, 220/06, 222/06*

U.S. Cl. 260—29.6 RW 12 Claims

1. A low molecular weight interpolymer which is at least inherently water-dispersible and which comprises, in polymerized from and based upon the total moles of monomer,

(a) from about 1 to about 25 mole percent of an alkenyl benzyl ether monomer having the formula:



where R is hydrogen or methyl, R_1 is a lower alkyl group and m is a positive integer of from about 10 to about 100;

(b) from about 20 to about 60 mole percent of a copolymerizable ethylenically unsaturated carboxylic acid monomer or a copolymerizable ethylenically unsaturated dicarboxylic anhydride monomer; and

(c) from about 25 to about 75 mole percent of a hydrophobic monomer.

10. An aqueous dispersion of water-insoluble organic or inorganic particulate matter containing an amount of the interpolymer of claim **1** which is sufficient to stabilize the dispersion.

4,151,342

PROCESS FOR PRODUCING FLUOROELASTOMER AND CROSSLINKED POLYMER THEREOF

Tetsuya Uchino; Michio Hisasue, and Hiroaki Kojima, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 13, 1977, Ser. No. 860,198

Claims priority, application Japan, Dec. 16, 1976, 51-150360

Int. Cl.[2] C08F *210/06, 214/26*

U.S. Cl. 526—273 **2 Claims**

1. An uncured fluoroelastomer carbo-polymerized copolymer of composition 50 to 65 mole % tetrafluoroethylene, 35 to 50 mole % propylene and 0.01 to 10 mole % glycidylvinyl ether monomer wherein said fluoroelastomer copolymer contains side chains with unreacted glycidyl groups which are derived from said glycidylvinyl ether monomer.

4,151,343

HIGH UNSATURATION BUTYL RUBBERS

Warren A. Thaler, Matawan; Donald J. Buckley, Plainfield, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 631,444, Nov. 13, 1975, Pat. No. 4,031,300, which is a continuation-in-part of Ser. No. 457,109, Apr. 1, 1974, Pat. No. 3,928,297, which is a continuation-in-part of Ser. No. 151,038, Jun. 8, 1971, Pat. No. 3,808,177. This application Apr. 18, 1977, Ser. No. 788,504

Int. Cl.[2] C08F *232/06, 210/12*

U.S. Cl. 526—308 **10 Claims**

1. A substantially gel free copolymer consisting of a major portion of one isoolefin having about 4 to 10 carbon atoms and about 5 to about 45 mole % of conjugated diene having about 5 to about 9 carbon atoms, said copolymer having an Mn from 90,000 to below 120,000, said one isoolefin being selected from the group consisting of isobutylene, 2-methyl-1-butene, 3-methyl-1-butene or 4-methyl-1-pentene, and said one diene being selected from the group comprising isoprene, piperylene or methyl cyclopentadiene.

4,151,344

RELEASE SUBSTRATE

Richard C. Doss, and Robert E. Reusser, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 29, 1977, Ser. No. 865,830

Int. Cl.[2] C08G *47/00*

U.S. Cl. 528—34 **5 Claims**

1. A composition suitable for application as a release coating comprising a high molecular weight polymethyldihydroxysiloxane, a low molecular weight polymethylhydrosiloxane, a low molecular weight silicate-derived polymer and a tetraalkyl titanate wherein the high molecular weight polymethyldihydroxysiloxane can be represented by the general formula $HO[Si(CH_3)_2O]_nH$ wherein n represents the number of repeating units in the polymer chain and is generally in the range of from about 1000 to about 5000; the low molecular weight polymethylhydrosiloxane can have a linear, cyclic or branched configuration and can be either a homopolymer or a copolymer in which

is from about 1 to about 10 percent by weight, based on the weight of the polymethyldihydroxysiloxane; the silicate-derived polymers have a molecular weight in the approximate range of from about 3000 to 10,000; and wherein a catalyst and an organic solvent are employed and wherein the ingredients are present in the approximate parts by weight:

Polymethyldihydroxysiloxane	3
Polymethylhydrosiloxane	0.03–0.3
Silicate-derived polymer	.1–.5
Tetraalkyl titanate	.05–2
Catalyst	.01–.6
Solvent	20–200

4,151,345

METHOD OF MAKING POLYURETHANE UTILIZING NICKEL ACETYLACETONATE

Donald V. Hillegass, Alliance, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 724,890, Sep. 20, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,719

Int. Cl.[2] C08G *18/22, 18/14, 18/62*

U.S. Cl. 528—56 **3 Claims**

1. In a process for preparing molded polyurethanes consisting of reacting a catalyst-polyol mixture with an organic polyisocyanate wherein the catalyst-polyol mixture is held at an elevated temperature of 120° C. for prolonged periods, molding said polyurethane and demolding a cured article, the improvement of employing as the catalyst-polyol mixture 0.01 to 0.08 gram of nickel acetyl acetonate per 100 grams of polyol, wherein in said process the gelation time is in excess of one minute, the time required to obtain a tack-free surface is at least seven minutes, and the demolding time is eight minutes.

4,151,346

PROCESS FOR PREPARING OXYMETHYLENE POLYMERS IN A GRANULAR FORM

Günter Sextro; Karlheinz Burg, both of Naurod; Helmut Schlaf, Fischbach; Hans J. Leugering, Frankfurt, and Alwin Heller, Erzhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 661,755, Feb. 26, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,441

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1975, 2508886

Int. Cl.[2] C08G *2/22, 2/28, 16/02*

U.S. Cl. 528—230 **6 Claims**

1. A process for preparing a granular oxymethylene polymer of high bulk weight containing in addition to oxymethylene units from 0.1 to 20% by weight of oxyalkylene units having from 2 to 8 adjacent carbon atoms in the main chain which comprises preparing a solution or fine dispersion of the oxymethylene polymer in a methanol/water mixture having a methanol content of at least 75% by weight and a temperature of 5° to 65° C. above the sintering temperature of the oxymethylene polymer, introducing the solution or dispersion of the oxymethylene polymer into a turbulent liquid cooling agent

which is a methanol/water mixture having a methanol content of at least 75% by weight at a temperature of 1° to 10° C. below the sintering temperature of the oxymethylene polymer to form granules of said polymer, separating the thus formed granular oxymethylene polymer and drying it to produce said high bulk weight granular polymer.

4,151,347

SEPARATION OF COFORMYCIN AND ITS RELATED NUCLEOSIDES

Hamao Umezawa, Tokyo, and Shinichi Kondo, Yokohama, both of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,258

Claims priority, application Japan, Mar. 15, 1977, 52-27648

Int. Cl.[2] C07H *17/00*; A61K *31/70*

U.S. Cl. 536—24 **9 Claims**

1. A process of separating coformycin from a mixture of coformycin with at least one related nucleoside selected from the group consisting of formycin A, formycin B, isocoformycin and 2′ deoxycoformycin, optionally with isolation of each components of the related nucleosides, which comprises subjecting an aqueous solution containing said mixture to column chromatography on a cation-exchanger having carboxylic groups partially activated by conversion into ammonium carboxylic groups or alkali metal carboxylate groups as the ion-exchange function thereof and developing with water or a buffer solution having a pH of at least 6.6, collecting in fractions the eluate flowing out of the column in such a manner that the fractions each containing solely coformycin are collected, optionally collecting the fractions each containing solely one of the related nucleosides or the other fractions each containing at least one of the related nucleosides, and recovering coformycin from the fractions containing solely coformycin.

4,151,348

CRYSTALLIZED POTASSIUM SALT OF ADENOSINE-5-DIPHOSPHORIC ACID AND METHOD OF PREPARING SAME

Heinrich Traeger, Penzberg; Herbert Brustmann, and Erich Haid, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,341

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722644

Int. Cl.[2] C07H *17/00*; A61K *31/70*

U.S. Cl. 536—27 **1 Claim**

1. Orthorhombic potassium salt of adenosine-5′-diphosphoric acid with the space group $P2_12_12$ and the elemental cell constants

$a=28.53\pm0.03$ Å

$b=10.49\pm0.02$ Å

$c=6.33\pm0.02$ Å

$\alpha=\beta=\gamma=90.0°$

Volume = 1894.4 Å^3.

4,151,349

CRYSTALLINE POTASSIUM SALT OF β-NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHORIC ACID AND METHOD FOR ITS PREPARATION

Heinrich Traeger, Penzberg; Herbert Brustmann, and Erich Haid, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 836,112

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1977, 2704109

Int. Cl.[2] C07H *17/00*; A61K *31/70*

U.S. Cl. 536—28 **1 Claim**

1. Crystalline potassium salt of β-nicotinamide adenine dinucleotide phosphoric acid in a primitively orthorhombic crystal system, with the space group $P2_12_12_1$ or $P2_12_12$, and the cell dimensions $a=52.23$ Å±0.03, $b=16.89$ Å±0.03, $c=8.45$ Å±0.03.

4,151,350

POLY-5-HYDROXYCYTIDYLIC ACID COPOLYMERS

Nowell Stebbing, High Wycombe, and Michael A. Eaton, Bledlow, both of England, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 5, 1977, Ser. No. 857,851

Claims priority, application United Kingdom, Dec. 23, 1976, 53822/76

Int. Cl.[2] C07H *17/00*; A61K *31/70*

U.S. Cl. 536—29 **4 Claims**

1. A copolymer having an $S_{w,20}$ value of from 3 to 13.5 and comprising essentially from 30 to 95% by weight, based on the total copolymer weight, of 5-hydroxycytidylic acid monomer, the balance being cytidylic acid, and/or monomers derived therefrom by bromination, there being at least 5% by weight, based on the total copolymer weight, of the cytidylic acid and/or bromination derivatives thereof.

4,151,351

7,8-DIDEHYDRO-PGI$_1$ COMPOUNDS

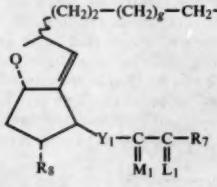
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 13, 1978, Ser. No. 869,141

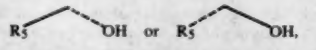
Int. Cl.[2] C07D *307/93*

U.S. Cl. 542—426 **63 Claims**

1. A prostacyclin intermediate of the formula



wherein g is the integer one, 2, or 3;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) —C≡C—;
wherein M_1 is

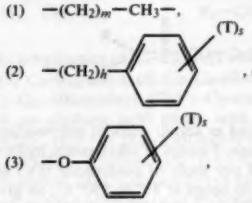


wherein R_5 is hydrogen or methyl; wherein L_1 is

or a mixture of

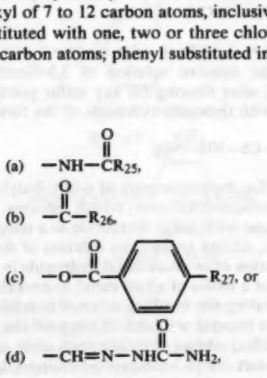
and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_7 is

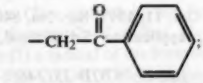


wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido, inclusive, phenacyl, i.e.,



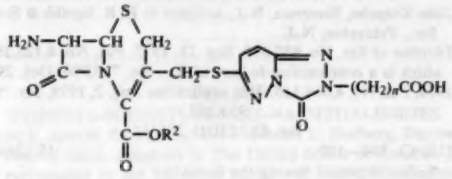
or phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation.

4,151,352
7-AMINO-3-(2-CARBOXYALKYL-2,3-DIHYDRO-s-TRIAZOLO[4,3-b]PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Kawasaki; Jun Okumura, Yokohama; Hajime Kamachi, Ichikawa; Seiji Iimura, Tokyo; Hideaki Hoshi, Ichikawa, and Masahisa Oka, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 784,885, Apr. 5, 1977, Pat. No. 4,082,912, which is a continuation-in-part of Ser. No. 701,443, Jun. 30, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,132
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—26 **4 Claims**

1. A compound having the formula



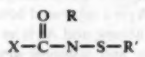
wherein n is one or two and R^2 is hydrogen or a conventional, pharmaceutically acceptable, easily hydrolyzed ester forming group selected from the group consisting of pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl; or a nontoxic, pharmaceutically acceptable salt thereof.

4,151,353
CARBAMOYL HALIDE COMPOSITIONS

Duane E. Thurman, Salinas, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 26, 1975, Ser. No. 590,716
Int. Cl.[2] C07D *295/22*; C07C *161/00*
U.S. Cl. 544—159 **17 Claims**

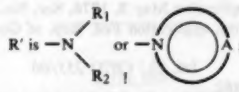
1. Compounds of the formula:



wherein:

X is fluorine or chlorine;

R may be hydrogen, lower alkyl, lower alkenyl, lower alkoxy or lower cycloalkyl either unsubstituted or, except where R is hydrogen, substituted with one or more chloro, bromo, fluoro, nitro or cyano substituents or a combination thereof or phenyl or lower phenyl alkyl, either unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower haloalkyl or lower alkoxy substituents or a combination thereof;



R_1 and R_2 are individually, hydrogen, alkyl, alkenyl, alkoxy, cycloalkyl, phenylalkyl, phenyl, which may be unsubstituted or substituted, except in the case of hydrogen, with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower haloalkyl, or lower alkoxy substituents or a combination thereof; or a saturated or unsaturated five or six membered heterocyclic radical in which there are one or two hetero atoms which may be oxygen, sulfur in all of its oxidation states or nitrogen including combinations thereof, all of which heterocyclic radicals may be unsub-

stituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower haloalkyl, or lower alkoxy substituents or a combination thereof;

A is a divalent aliphatic chain which may be alkylene, alkenylene or an aliphatic chain which may include one or two hetero atoms of oxygen, sulfur or nitrogen or a combination thereof to form a five or six membered ring structure which may be unsubstituted or substituted with one or more chloro, bromo, fluoro, nitro, cyano, lower alkyl, lower haloalkyl or lower alkoxy substituents or a combination thereof.

4,151,354

SUBSTITUTED AMIDES AND SULFONAMIDES HAVING ANTIINFLAMMATORY ACTIVITY

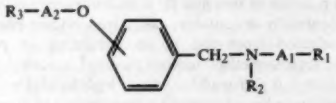
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 835,099, Sep. 21, 1977, Pat. No. 4,122,255, which is a continuation-in-part of Ser. No. 736,990, Oct. 29, 1976, Pat. No. 4,064,125. This application Aug. 2, 1978, Ser. No. 930,263

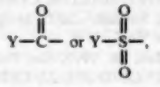
Int. Cl.[2] C07D *295/14*

U.S. Cl. 544—159 **15 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is alkyl, cycloalkyl or aryl; R_2 is



wherein Y is alkyl, cycloalkyl, aryl, or arylalkyl; R_3 is 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, or 4-alkyl-1-piperazinyl; A_1 is a saturated bond or an alkylene group having 1 to 4 carbon atoms; and A_2 is an alkylene group having 2 to 5 carbon atoms; and wherein aryl is phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro, or amino group; alkyl and alkoxy are groups having 1 to 6 carbon atoms; and cycloalkyl is a group having 3 to 7 carbon atoms.

4,151,355

PROCESS FOR THE PREPARATION OF 6-TERT.-BUTYL-3-MERCAPTO-4-AMINO-1,2,4-TRIAZIN-5(4H)-ONE

Walter Merz, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 640,830, Dec. 15, 1975, Pat. No. 4,113,767. This application May 8, 1978, Ser. No. 904,072

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460889

Int. Cl.[2] C07D *253/06*

U.S. Cl. 544—182 **28 Claims**

1. A process which comprises

(1) reacting pinacolone, of the formula

$$(CH_3)_3C—CO—CH_3 \quad \text{(IV)},$$

with a sulfur chloride of the general formula

$$S_nCl_2 \quad \text{(XII)},$$

wherein

n is 1 or 2,

at a temperature between 0° and 80° C.,

(2) reacting the reaction mixture directly, without further purification, with an aqueous solution of an amine of the general formula

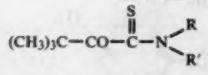
(XIII),

in which

R and R′ which may be identical or different, are each hydrogen, alkyl of from 1 to 8 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms and which is optionally substituted by methyl or chlorine, or

R and R′ conjointly form a radical $—(CH_2)_m—$ (where m=4, 5, or 6) or $—(CH_2)_2—O—(CH_2)_2—$,

(3) hydrolyzing the thus-formed tert.-butyl-glyoxylthioamide of the general formula



(XIV)

wherein

R and R′ identified as above without intermediate isolation by adding at least 2 moles of alkali metal hydroxide of the formula MOH per mole of pinacolone (IV) and heating for from 2 to 10 hours at 80° to 150° C., to give an alkali metal salt of 3,3-dimethyl-2-oxo-butyric acid of the formula

$$(CH_3)_3C—CO—COO^{\ominus}M^{\oplus} \quad \text{(Ia)},$$

wherein

M is an alkali metal,

(4) liberating the 3,3-dimethyl-2-oxo-butyric acid of the formula

$$(CH_3)_3C—CO—COOH \quad \text{(I)},$$

from the salt (Ia) by acidifying with a mineral acid, and

(5) reacting the aqueous solution of 3,3-dimethyl-2-oxo-butyric acid, after filtering off any sulfur precipitated on acidifying, with thiocarbohydrazide of the formula

$$H_2N—NH—CS—NH—NH_2 \quad \text{(II)}.$$

28. A process for the preparation of 6-tert.-butyl-3-mercapto-4-amino-1,2,4-triazin-5(4H)-one which process comprises reacting pinacolone with sulfur dichloride at a temperature of from 0° to 80° C., adding an aqueous solution of dimethylamine, adding a solution of an alkali metal hydroxide in an amount to provide at least 2 moles of alkali metal hydroxide per mole of pinacolone, heating the resulting mixture to release dimethylamine, adding a mineral acid and filtering off the precipitating elemental sulfur, adding thiocarbohydrazide to give the desired 6-tert.-butyl-3-mercapto-4-amino-1,2,4-triazine-5(4H)-one.

4,151,356

5-TRIAZIN-2-YL PHOSPHONATES

Samuel Evans, Basel, and Michael Rasberger, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

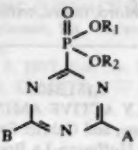
Filed Oct. 11, 1977, Ser. No. 840,705

Claims priority, application Switzerland, Oct. 18, 1976, 13165/76

Int. Cl.[2] C07D *251/48*

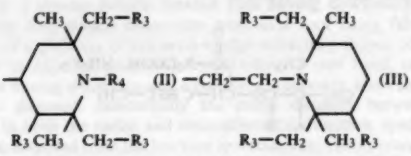
U.S. Cl. 544—195 **5 Claims**

1. A member selected from the group consisting of a compound of the formula

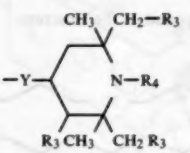


and a salt thereof,

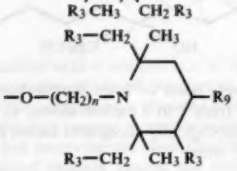
wherein R_1 and R_2 independently represent hydrogen, C_1–C_{18}-alkyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a radical of the formula II or III



wherein R_3 is hydrogen or C_1–C_8-alkyl and R_4 is (1) hydrogen, (2) oxyl, (3) C_1–C_{12}-alkyl, (4) C_3–C_6-alkenyl, (5) C_3–C_4-alkinyl, (6) C_2–C_{21}-alkoxyalkyl, (7) C_7–C_8-aralkyl, (8) 2,3-epoxypropyl, (9) an aliphatic acyl group with 1–9 C atoms, (10) $—CH_2COOR_5$, (11) $—CH_2—CH(R_6)—OR_7$, (12) $—COOR_8$ or (13) $—CONHR_8$, wherein R_5 is (1) C_1–C_{12}-alkyl, (2) C_3–C_6-alkenyl, (3) phenyl, (4) C_7–C_8-aralkyl or (5) cyclohexyl and R_6 is hydrogen, methyl or phenyl and R_7 represents (1) hydrogen, (2) an aliphatic-, aromatic-, araliphatic- alicyclic acyl group having 1–18 C atoms, in which the aromatic portion is unsubstituted or substitituted by at least one member of the group of chlorine, C_1–C_4-alkyl or C_1–C_8-alkoxy and by hydroxyl, and R_8 represents C_1–C_{12}-alkyl, cyclohexyl, phenyl or benzyl; A represents (1) a radical of the formula IV or V



(IV)



(V)

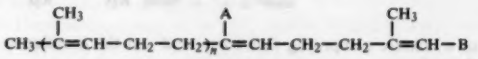
wherein R_3 and R_4 are as defined above, n is 1, 2 or 3 and R_9 is hydrogen or hydroxyl and Y is —O— or $—NR_{10}—$, wherein R_{10} is (a) hydrogen, (b) C_1–C_{18}-alkyl, (c) C_6–C_{10}-aryl, (d) C_7–C_{18}-aralkyl or (e) a radical of the formula II as defined above, or (2) A is $—P(=O)(OR_1)OR_2$, —S—R_{11}, $—NR_{12}R_{13}$ or $—OR_{14}$, wherein R_1 and R_2 are as defined above, R_{11} is (1) C_1–C_{18}-alkyl, (2) C_5–C_7-cycloalkyl, (3) C_6–C_{10}-aryl, (4) C_7–C_9-aralkyl, or (5) the group $—(C_pH_{2p})—CO—OR_{15}$, in which R_{15} is C_1–C_{18}-alkyl, and p denotes 1 to 6, and R_{12} and R_{13} independently represent (1) hydrogen, (2) C_1–C_{18}-alkyl, (3) C_3–C_4-alkenyl, (4) C_5–C_7-cycloalkyl, (5) C_6–C_{10}-aryl, (6) C_7–C_9-aralkyl or (7) a radical of the formula II as defined above, and R_{14} denotes C_1–C_{18}-alkyl, C_6–C_{10}-aryl or C_7–C_9-aralkyl; and B is (1) a radical of the formula IV or V as defined above or (2) $—P(=O)(OR_1)OR_2$, in which R_1 is a radical of the formula II or III as defined above and R_2 is as defined above.

4,151,357
POLYPRENYL PIPERAZINES

Hiroshi Mishima; Akira Ogiso, and Shinsaku Kobayashi, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,699
Claims priority, application Japan, Apr. 24, 1976, 51-46937
Int. Cl.[2] C07D *295/18*
U.S. Cl. 544—386 2 Claims

1. A polyprenyl compound having the formula:



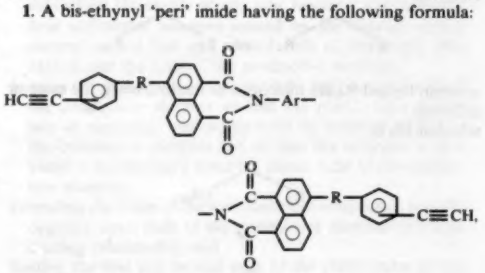
wherein A is $—CH_2—OH$ and B is 4-phenyl or 4-(2-hydroxyethyl)-piperazino carbonyl and n is 2.

4,151,358
ETHYNYL-SUBSTITUTED BIS-NAPHTHALIMIDES

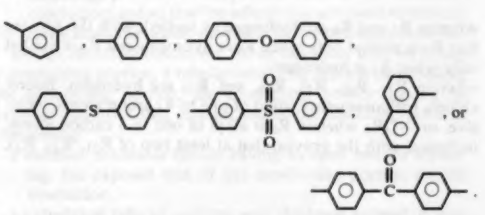
Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 750,945, Dec. 15, 1976, Pat. No. 4,086,248.
This application Jan. 19, 1978, Ser. No. 870,793
Int. Cl.[2] C07D *401/12, 401/10*
U.S. Cl. 546—98 6 Claims

1. A bis-ethynyl 'peri' imide having the following formula:



where R is oxygen or sulfur and Ar is

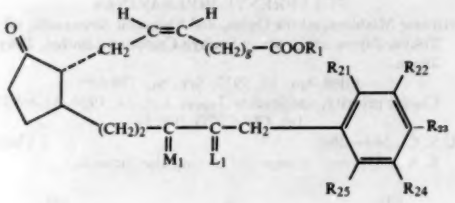


4,151,359
11-DEOXY-17-PHENYL-13,14-DIHYDRO-PGE$_2$ COMPOUNDS

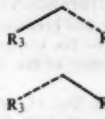
Gordon L. Bundy, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 542,372, Jan. 20, 1975, Pat. No. 4,029,693.
This application Feb. 28, 1977, Ser. No. 772,829
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 22 Claims

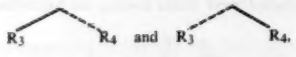
1. A compound of the formula



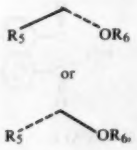
or a mixture comprising that compound and the enantiomer thereof;
wherein g is 3 to 5, inclusive;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one or two alkyl of one to 3 carbon atoms, inclusive, or chloro, or a pharmacologically acceptable cation;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen and R_6 is methyl only when R_5 is hydrogen;
wherein R_{21}, R_{22}, R_{23}, R_{24}, and R_{25} are hydrogen, fluoro, chloro, trifluoromethyl, alkyl of one to 4 carbon atoms, inclusive, or $—OR_8$ wherein R_8 is alkyl of one to 3 carbon atoms, inclusive, with the proviso that at least two of R_{21}, R_{22}, R_{23}, R_{24}, and R_{25} are hydrogen, and not more than two of R_{21}, R_{22}, R_{23}, R_{24}, and R_{25} are chloro, fluoro, trifluoromethyl or $—OR_8$.

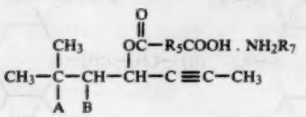
4,151,360

OPTICALLY ACTIVE AMINE SALTS

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,401, Sep. 15, 1976, Pat. No. 4,045,475, which is a division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application May 16, 1977, Ser. No. 796,928
Int. Cl.[2] C07C *69/34, 69/83*
U.S. Cl. 560—95 **2 Claims**

1. The salt of the formula:



wherein A and B are individually hydrogen or taken together form a carbon to carbon bond R_5 is a divalent phenyl or $—(CH_2)_n—$; R_7NH_2 is an optically active amine selected from the group consisting of brucine, ephedrine, quinine dehydroabietylamine, alpha-methyl benzylamine and alpha methyl-p-nitro benzylamine; and n is an integer of 0 to 4.

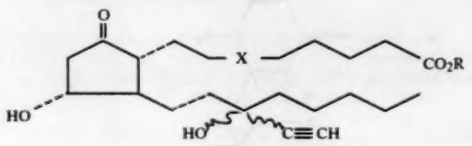
4,151,361

PROSTAGLANDIN DERIVATIVES

George E. M. Husbands, Devon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 739,364, Nov. 5, 1976, Pat. No. 4,089,885. This application Mar. 6, 1978, Ser. No. 884,063
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 **6 Claims**

1. A chemical compound of the structure:



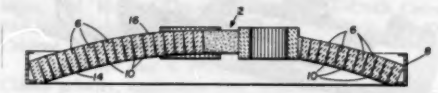
wherein X is a single bond or a cis double bond, and R is hydrogen, alkyl of from 1 to 6 carbon atoms, an alkali metal cation, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

ELECTRICAL

4,151,362
ELECTRIC FURNACE ROOF

Ronald L. Hart, Mt. Lebanon, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 5, 1977, Ser. No. 857,058
Int. Cl.[2] F27D *1/02*
U.S. Cl. 13—35 5 Claims

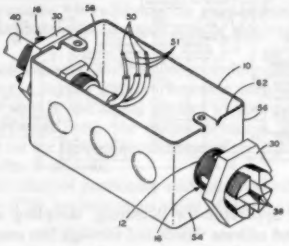


1. In a sprung electric furnace roof having downwardly-opening dish-shaped dome-type roof, said roof being fabricated of a plurality of key-arch-wedge refractory shapes contained in adjacent concentric rings within a roof band, said shapes having a hot face and a cold face, expansion allowance means disposed, substantially the entire distance, between brick in both the radial and circumferential direction, spacer means, disposed from the hot face to a relatively short distance above the hot face, between brick at least in the radial direction, said roof being devoid of any metal plating or suspension.

4,151,363
METHOD AND APPARATUS FOR JOINING ELECTRICAL CONDUCTORS TO JUNCTION BOXES

Wayne L. Nichols, 2921 Euclid Ave., Fort Wayne, Ind. 46806

Filed Dec. 20, 1976, Ser. No. 752,403
Int. Cl.[2] H02G *3/18;* F16H *5/00*
U.S. Cl. 174—65 R 5 Claims

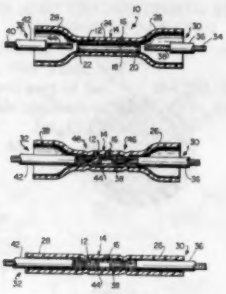


1. In combination with a junction box, an improved connector device for joining electrical conductors to such junction boxes and the like comprising a threaded stem having a shoulder, a central through passage means forming an opening in the junction box and receiving the stem therethrough, with said shoulder in seated relation against the outer surface of the junction box, a plurality of radially inwardly compressible members integrally related with said stem and flaring outwardly toward their free ends and threaded at the outer surface thereof for receiving a ring nut thereon which, as it threadedly advances, effects inwardly compressing action on said flared members, means forming a longitudinal passage centrally of said members and disposed coaxially relative to the opening in said stem whereby an electrical conductor can be passed successively therethrough, gripping surfaces at the radially inner portions of said projections engageable against confronting surfaces of the conductor responsively to movement of the ring nut urging radially inward movement of said projections thereby to effect gripping connections between the conductor and said gripping surfaces with the conductor having a free end projecting within said junction box, and a second nut threadedly received over said stem to clamp a portion of the junction box between said second nut and said shoulder and thereby holding the device and its attached conductor rigidly in place.

4,151,364
ELECTRICAL CONNECTORS AND METHODS OF CONNECTING ELECTRICAL CONDUCTORS

J. Scott Ellis, 1031 Shadow Brook Dr., San Jose, Calif. 95120

Filed Sep. 29, 1976, Ser. No. 727,669
Int. Cl.[2] H01R *5/10*
U.S. Cl. 174—84 C 15 Claims



8. A method of connecting two electrical conductors, each of the conductors including a conducting portion surrounded by an insulating portion with the conducting portion having a lead extending past the end of the insulating portion, comprising the steps of

interposing an open-ended tubular conductive member inside a heat shrinkable plastic tube having a normally dry, heat activatable adhesive coated on the interior surface thereof so that first and second ends of the plastic tube extend past the ends of the conductive member,

heating the portion of the plastic tube between the ends of the conductive member so that the plastic tube shrinks into an engaging relationship with the exterior surface of the conductive member and so that the adhesive is activated to hermetically bond the plastic tube to the conductive member,

extending the leads of the two electrical conductors into the opposite open ends of the conductive member in a conducting relationship, and

heating the first and second ends of the plastic tube so that the ends shrink into an engaging relationship with the insulating portions of respective ones of the electrical conductors and so that the adhesive is activated to hermetically bond the plastic tube ends to the insulating portions.

15. An electrical conductor for an electrical wire including a conducting portion, a tubular insulating portion surrounding the conducting portion, the conducting portion having an exposed end extending past an end of the insulating portion, comprising:

a metallic, malleable ferrule having an open end for receiving the exposed end of the conducting portion on the conductor;

a cylindrical tube of uniform wall thickness formed of heat shrinkable plastic and having open ends for respectively receiving the insulating portion on the conductor and said ferrule;

normally dry, heat activatable adhesive coated on the entire interior surface of said tube; and

said ferrule being adhesively secured in one end of said tube against longitudinal movement by radial reduction of one end of said tube and activation of said adhesive by heating said one end of said tube surrounding said ferrule,

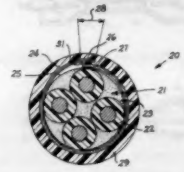
the exposed end on the conductor being connectable to said ferrule by mechanical deformation of said ferrule by crimping,

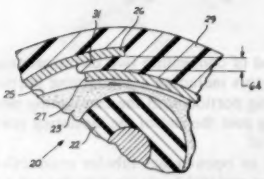
the insulating portion on the conductor being securable and hermetically bondable to said tube by reduction of said tube other end receiving the insulating portion and activation of said adhesive by heating said tube at said other end.

4,151,365
FILLED SERVICE CABLE HAVING CORRUGATED SHIELD AND METHODS OF MAKING

Joseph M. Hacker, Fallston, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,600
Int. Cl.[2] H01B 7/20, 11/06, 13/24, 13/26
U.S. Cl. 174—107 3 Claims





1. A method of making a cable in which a core is enclosed in a shield having an overlapped longitudinally extending seam and a jacket of a vinyl chloride polymer material, the method comprising the steps of:

advancing a cable core;

wrapping longitudinally a corrugated metallic tape about the core to form a shield having an overlapped longitudinally extending seam;

radially separating the overlapped longitudinal edge portions of the shield; and

extruding a vinyl chloride polymer material about the shield with a portion of the extrudate forming an intrusion of polymeric material having substantially predetermined dimensions between the overlapping edge portions of the shield.

3. A cable which is produced in accordance with the method of claim 1.

4,151,366
FLAME RESISTANT, INSULATED MULTI-CONDUCTOR ELECTRIC CABLE

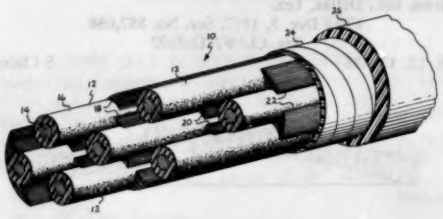
Joseph E. Betts, Westport; Alfred C. Bruhin, Huntington, both of Conn., and Robert P. Hoeppner, Glen Ellyn, Ill., assignors to General Electric Company, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,588
Int. Cl.[2] H01B 3/28
U.S. Cl. 174—116 16 Claims

1. A Flame-resisting, insulated multi-conductor electrical cable, consisting essentially of:

(a) a plurality of electrical conductors individually insulated with a cross-link cured ethylene-containing polymer compound including a halogen-containing flame retarding agent, said plurality of insulated electrical conductors being stranded together in a side-by-side group arrangement having interstices therebetween;

(b) a plurality of elongated filler strips composed of styrene-butadiene copolymer containing hydrated alumina filler therein occupying interstices formed intermediate the stranded insulated conductors; and

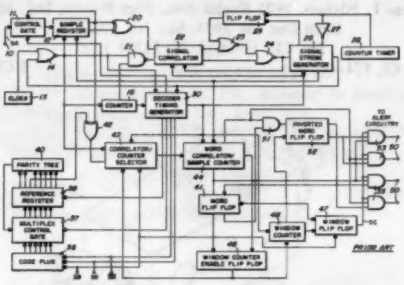


(c) an enclosure surrounding the group of stranded insulated conductors with elongated filler strips occupying the interstices.

4,151,367
DATA SYNC ACQUISITION IN AN ASYNCHRONOUS BINARY ADDRESS DECODER

John D. Nicolini, Margate, and David F. Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1977, Ser. No. 792,161
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 7 Claims



1. In an apparatus for detecting, sampling and decoding binary-coded address words and message bits contained within a received train of pulses, circuitry for providing a synchronizing pulse for the sampling of said message bits and comprising in combination:

timing means for providing a first timing pulse during each address sampling period;

first bistable circuit means for providing a signal enabling the detection of selected ones of the address words;

detect circuit means for providing a page detect pulse in response to the detection of the binary address;

first gating means coupled to the bistable means for being enabled by a level transition of the word select enabling signal, and to the timing means for providing an output signal in response to the next subsequent timing pulse from the timing means;

second bistable means coupled to the detect circuit means for being set by the page detect pulse and coupled to the first gating means for being reset by the output signal of the gating means;

second gating means coupled to the first bistable circuit means for initiating a sync pulse in response to a level transition of the work select enabling signal and to the second bistable means for ending said sync pulse in response to a level transition in the output signal of said second bistable means; and

sampling means for receiving the message bits and coupled to the output of the second gating means for providing

message bit sampling pulses synchronized by said sync pulse.

4,151,368

MUSIC SYNTHESIZER WITH BREATH-SENSING MODULATOR

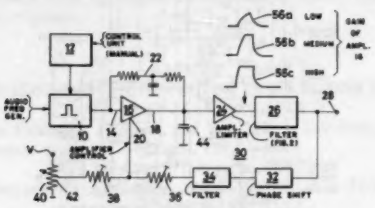
Jobst Fricke; Wolfgang Voigt, and Jürgen Schmitz, all of Cologne, Fed. Rep. of Germany, assignors to CMB Colonia Management- und Beratungsgesellschaft mbH & Co. KG., Cologne, Fed. Rep. of Germany

Filed Aug. 6, 1976, Ser. No. 712,339

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535344

Int. Cl.[2] G10H *3/00*

U.S. Cl. 179—1 M 10 Claims



1. A circuit for producing a sound signal comprising a sound signal source (10) driving a signal modification channel including in cascade a variable gain amplifier (16) which multiplies its input signal by a gain control signal, a limiter (24,25), a low pass filter (25,46,54), formant filter means (48,50,52), and output terminal (28),

said signal modification channel further having a gain control terminal (20) for receiving the gain control signal to control the instantaneous signal gain of said variable gain amplifier,

and a feedback channel (30,32,34,36) including circuit means (34) having a signal transfer function providing for a frequency limit of the signal applied to said gain control terminal derived from the output terminal signal, and dependent on the instantaneous value of the signal applied to the feedback channel,

said feedback channel producing said gain control signal as a function of the instantaneous value of said output signal.

4,151,369

SOUND REPRODUCTION SYSTEMS

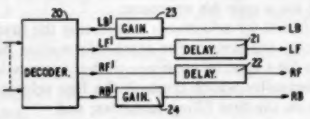
Michael A. Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England

Filed Nov. 22, 1977, Ser. No. 854,039

Claims priority, application United Kingdom, Nov. 25, 1976, 49117/76

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 GQ 7 Claims



1. A decoder for producing output signals which, if fed to at least three loudspeakers disposed at respective azimuths around a reference point at non-uniform distances therefrom, would produce a desired directional effect, comprising a basic decoder which, if fed to loudspeakers disposed at said azimuths at a uniform distance from the reference point would produce said desired directional effect, means for subjecting each output of the basic decoder to a relative time delay proportional to the difference between the distance from the reference point of the loudspeaker at the azimuth to which the output relates and the distance from the reference point of the most distant loudspeaker and to an amplitude gain proportional to the distance of the loudspeaker at said azimuth at the reference point.

4,151,370

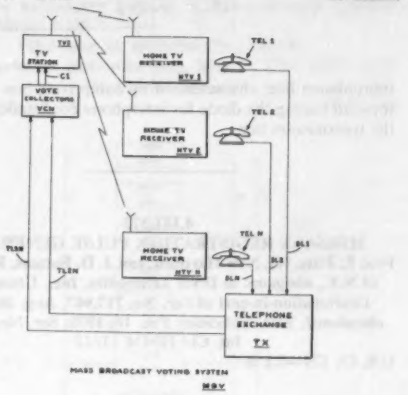
RECEPTION AND TRANSMISSION SYSTEM FOR POLLING APPARATUS

John J. Root, Bronx, N.Y., assignor to Votrak Information Systems, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 689,784, May 25, 1976, abandoned. This application Dec. 3, 1976, Ser. No. 747,369

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 AS 10 Claims



7. Apparatus for indicating the number of choices made with respect to two possibilities comprising: a plurality of telephones; a first telephone call counter having assigned thereto a first telephone number and being associated with one of said two possibilities; a second telephone call counter having assigned thereto a second telephone number and being associated with the other of said possibilities; each of said call counters comprising a plurality of lines each assigned the same telephone number; a plurality of call completeing means, each of said call completing means periodically and simultaneously answering and then terminating any calls received by a different group of telephone lines of said plurality; a first pulse serializer means connected to at least one of said call completing means for emitting a first count pulse signal for each n complete calls, where n is an integer, and pulse counter means for counting the count pulse signals; and a telephone system for selectively connecting said telephones to said call counters in accordance with the telephone numbers called by the telephones of said plurality.

4,151,371

REMOTE METER READING APPARATUS COMPRISING INTERPHONE MEANS

Ichiro Yoshihara, and Takeshi Abe, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 861,670

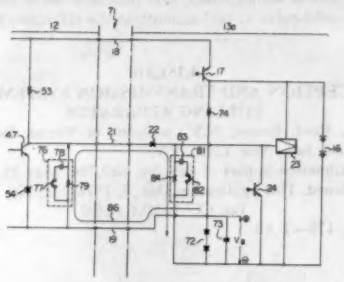
Claims priority, application Japan, Dec. 23, 1976, 51/155457; Dec. 23, 1976, 51/155458; Dec. 23, 1976, 51/155459

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 AM 9 Claims

1. A remote meter reading apparatus comprising a remote station including a meter; a main station; a transmission line interconnecting the remote station with the main station, the main station including means for reading the meter over the transmission line; a reverse current blocking diode provided in the transmission line; a remote interphone provided at the

remote station and connected to the transmission line; a main interphone provided at the main station and connected to the



transmission line; characterized by comprising bias means for forward biasing the diode for interphone communication over the transmission line.

4,151,372

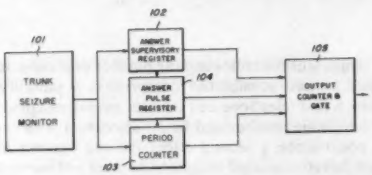
MESSAGE REGISTRATION PULSE GENERATOR

Fred E. Fitts, III, New Hartford, and J. D. Batteas, Rome, both of N.Y., assignors to DND Teletronics, Inc., Utica, N.Y.

Continuation-in-part of Ser. No. 717,947, Aug. 26, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,261

Int. Cl.[2] H04M *15/12*

U.S. Cl. 179—7.1 R **13 Claims**



1. A message registration pulse generator, comprising:

a trunk seizure monitor for providing a predetermined voltage level output in response to sensing a completed telephone interconnection;

a clock pulse generator for providing a continual series of equally spaced electrical pulses;

an output counter including circuit means presettable to represent a predetermined number of electrical pulses;

an answer supervision register responsive to said trunk seizure monitor output and said clock pulse generator for presetting said output counter;

an answer pulse register responsive to said trunk seizure monitor output and said clock pulse generator for presetting said output counter;

a period counter responsive to said trunk seizure monitor output and said clock pulse generator for initiating the timing of a predetermined time period, said period counter presetting said output counter after the expiration of said timed period;

said output counter including a pulse input means and an output means for providing an output signal when a number of pulses have been applied to said pulse input means which equal the preset number in said output counter; and

a message registration output pulse gate means, inhibitable by said output signal of said output counter, for producing message registration output pulses and applying pulses to said output counter pulse input in response to said clock pulse generator when not so inhibited.

4,151,373

DATA TRANSMISSION SYSTEM

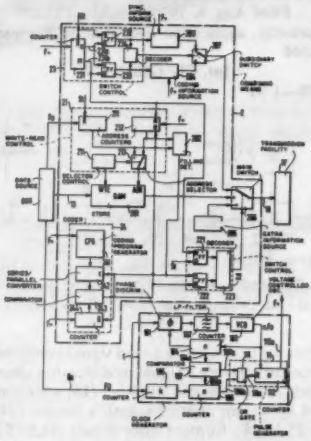
Walter R. Widmer, Niederhasli; Hans-Jorg Klemenz, Dielsdorf, and Pierre Schmid, Oberweningen, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Sep. 7, 1977, Ser. No. 831,297

Claims priority, application Switzerland, Sep. 9, 1976, 11445/76

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 AF **10 Claims**



1. A system for inserting extra-information bits into a bit sequence to be transmitted over a transmission channel and for suppressing such bits from the transmitted bit sequence, the system including at the transmitting end an inserter which inserts into an input bit sequence arriving at a first clock frequency m extra bits per m.k.n bits of the input bit sequence to produce an output bit sequence having a second clock frequency which is higher than the first clock frequency by the number of inserted extra bits, k, n and m denoting integers which are greater than zero, and further including at the receiving end a suppressor which filters out said inserted extra bits from the output bit sequence and thereby restores the original input frequency at the first clock frequency, said inserter comprising:

first clock generating means deriving from said input bit sequence at said first clock frequency a clock signal having a second clock frequency;

a first intermediate store;

first means for writing the input sequence thereinto at the first clock frequency and for reading out such sequence at the second clock frequency;

first filling monitors for the first intermediate store;

a source for extra-information bits;

a source for a sync bit sequence;

a first selector for selectively connecting the first intermediate store, the source for extra-information bits, and the source for a sync bit sequence to the transmission channel;

a first controller which controls the first selector in dependence on the first filling monitors; and

a first coding stage connected to the first controller and controlling, according to a given coding program, aperiodically the number of extra-information bits to be inserted into the input bit sequence per insertion operation; and said suppressor comprising:

second clock generating means deriving from said output bit sequence at said second clock frequency a clock signal having said first clock frequency;

a second intermediate store;

second means for writing the transmission end output bit sequence into such store at the second clock frequency

and for reading such bit sequence out of the store at the first clock frequency;

second filling monitors for the second intermediate store;

a sink for extra-information bits;

a second selector for selectively connecting the transmission channel to the input of the second intermediate store and the sink;

a second controller which controls the second selector in dependence on the second fillng monitors;

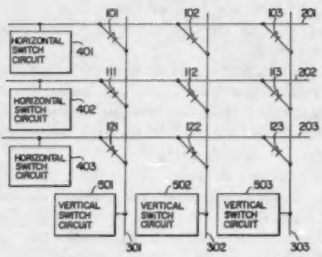
a sync bit sequence identifier which, when it identifies such a bit sequence, brings the second controller into the stand-by state, and

a second coding stage connected to the second controller and controlling, according to said given coding program, the number of extra-information bits which must be suppressed from the output bit sequence to restore the input bit sequence.

4,151,374
BUS CONNECTION DETECTOR CIRCUIT FOR BUS CONNECTION MATRIX CIRCUIT

Takeshi Fukuhara, Fujisawa, and Yuji Miura, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 9, 1977, Ser. No. 794,706
Claims priority, application Japan, May 10, 1976, 51-52207
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 GF **4 Claims**



1. In a bus connection matrix circuit comprising:

a plurality of horizontal and vertical buses arranged in a matrix array;

a plurality of switching elements each connected at a different one of the crosspoints of said matrix array between one of said horizontal buses and one of said vertical buses, each of said switching elements having a PNPN semiconductor four-layered structure and two major electrodes between which a conductive path is selectively formed in response to the application of a control voltage of a predetermined level thereacross, said switching elements being turned on when said control voltage is supplied thereacross; and

means for supplying said control voltage between selected ones of said horizontal buses and selected one of said vertical buses,

the improvement comprising a bus connection detector circuit connected to at least one of the two bus groups comprised of said horizontal buses and said vertical buses including:

a plurality of first diodes connected in common to one another at one end with the same polarity thereof, each of said first diodes being connected at the other end thereof to a different one of the buses of the one of said two bus groups;

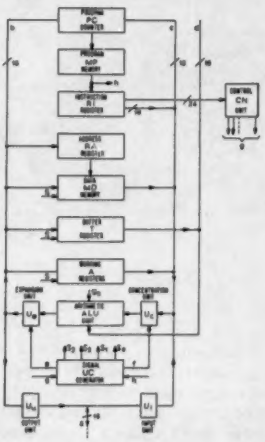
a zener diode connected at one end thereof to said common end of said first diodes, said zener diode having a breakdown voltage corresponding to the control voltage for the switching elements to detect when said control voltage appears on one of said buses so that said zener diode and the one of said first diodes connected to the one of said buses may conduct when said control voltage appears; and

voltage level sensing means connected to the other end of the said zener diode for providing an output in response to the conduction of said zener diode.

4,151,375
SYSTEM FOR SELECTIVELY SHIFTING GROUPS OF BITS FOR TEMPORARY STORAGE IN A PROCESSOR MEMORY OF A TELEPHONE EXCHANGE

Mario Bambara, and Francesco Cotroneo, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed May 11, 1977, Ser. No. 795,898
Claims priority, application Italy, May 12, 1976, 23174 A/76
Int. Cl.[2] H04Q *3/54*
U.S. Cl. 179—18 ES **7 Claims**



1. In an electronic processor provided with temporary storage means having zones each capable of storing n multibit groups of k bits each in respective sections thereof, said groups occupying relative positions of different ranks and including a lowest-ranking first group and a highest-ranking n^{th} group, and with a logic network performing arithmetic operations on incoming multibit groups received from said storage means and sending the results of said operations as outgoing multibit groups to said storage means, the processor further including a program memory and control means responsive to instructions read out from said program memory for controlling the operations of said logic network,

the combination therewith of:

a concentration unit inserted between an output of said storage means and an input of said logic network for selectively shifting incoming multibit groups from a higher-ranking position to a lowest-ranking position;

an expansion unit inserted between an output of said logic network and an input of said storage means for selectively shifting outgoing multibit groups from the lowest-ranking position to a higher-ranking position; and

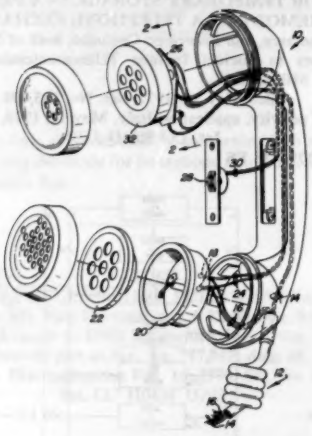
signal-generating means responsive to commands from said control means and to code words from said program memory, forming part of read-out instructions, for actuating said concentration and expansion units and for enabling corresponding sections of said storage means to receive outgoing multibit groups in the positions assigned to them.

4,151,376

AMPLIFIER FOR TELEPHONE HANDSET

Wesley F. Walker, Jr., Ringgold, Ga., assignor to Walker Equipment & Service Co., Ringgold, Ga.

Filed Jan. 24, 1977, Ser. No. 761,932
Int. Cl.[2] H04M *1/60*
U.S. Cl. 179—81 B 9 Claims



1. An amplifier assembly for a telephone handset having first and second ends separated by a handle, a receiver at the first end and a transmitter at the second end and standard telephone line cord having a pair of receiver input signal lines which extend within the handset to the first end for direct connection to the handset receiver and a pair of transmitter input lines which extend within the handset at the second end for direct connection to the handset transmitter, comprising:

a printed circuit board mounted on and electrically connected to the receiver at the first end of the handset,

transformer means mounted on said printed circuit board, said transformer means having a pair of primary terminals and a pair of secondary terminals, one of said primary terminals being connected to one of said receiver input signal lines and the other of said primary terminals being connected to the other of said receiver input signal lines, without alteration of the receiver input signal lines and independently of the polarities of the receiver input signal lines,

a pair of supply lines connected to the transmitter input signal lines without alteration of the transmitter input signal lines,

rectifier means mounted on said printed circuit board, said rectifier means having a pair of input terminals and a pair of output terminals, one of said input terminals being connected to one of said supply lines and the other of said input terminals being connected to the other of said supply lines, independently of the polarities of the supply lines, and

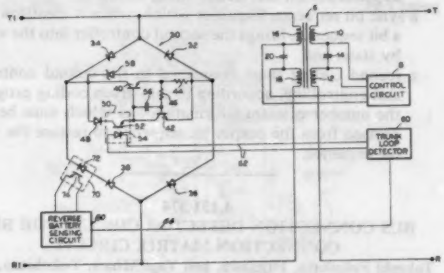
an amplifier mounted on said printed circuit board for amplifying an input signal on the receiver input signal lines and for driving the handset receiver with the amplified signal, said amplifier being connected to said transformer means secondary terminals and to said rectifier means output terminals.

4,151,377

HIGH IMPEDANCE LOOP-SEIZING AND DIAL PULSING CIRCUIT

Donald E. Whitaker, Jackson, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,781
Int. Cl.[2] H04M *3/02;* H04L *25/02*
U.S. Cl. 179—84 R 13 Claims



5. In a loop-seizing circuit comprising:

first, second, third and fourth terminals;

first, second, third and fourth diode means each respectively connected between said first and second terminals, said second and third terminals, said third and fourth terminals, and said fourth and first terminals;

a constant current source connected between said first and third terminals,

said constant current source comprising a transistor having a first, second, and base leads, first means for connecting said first lead to said first terminal and second means for connecting said second lead to said third terminal;

the improvement comprising:

a constant current diode;

third means for connecting said constant current diode to said first terminal;

and fourth means for connecting said constant current diode to said base lead.

4,151,378

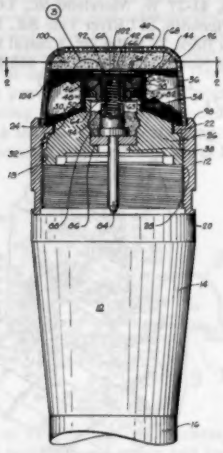
ELECTROSTATIC MICROPHONE WITH DAMPING TO IMPROVE OMNIDIRECTIONALITY, FLATTEN FREQUENCY RESPONSE, REDUCE WIND NOISE

Alan R. Watson, Niles, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed May 8, 1978, Ser. No. 903,809
Int. Cl.[2] H04R *1/20, 19/04*
U.S. Cl. 179—111 R 7 Claims

1. A condenser microphone comprising a condenser unit including a hollow shell having a first end and a second end, said shell being open at the first end thereof, an electrically conducting diaphragm confronting the open first end of the shell and an electrically conducting back plate disposed on the side of the diaphragm opposite the open first end of the shell, said back plate being spaced from and electrically insulated from the diaphragm, a casing having one end with a cross section greater than the cross section of the shell, means for mounting the second end of the shell on said one end of the

casing, said shell extending outwardly from said one end of the casing, and a mass of closed cellular plastic foam material



disposed about the exterior surface of the shell and extending from the one end of the casing to the open end of the shell.

4,151,379

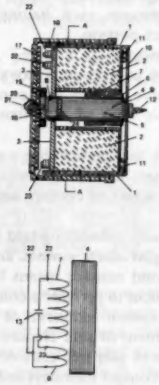
ELECTROMAGNETIC SPEAKER WITH BUCKING PARALLEL HIGH AND LOW FREQUENCY COILS DRIVES SOUNDING BOARD AND SECOND DIAPHRAGM OR EXTERNAL APPARATUS VIA MAGNETIC COUPLING AND HAVING ADJUSTABLE AIR GAP AND SLOT POLE PIECE

William J. Ashworth, Rte. 2, 1012 W. Lake Brantley, Maitland, Fla. 32751

Continuation-in-part of Ser. No. 816,933, Jul., 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,376

Int. Cl.[2] H04R *1/02, 3/08, 3/12, 11/02*

U.S. Cl. 179—114 R **31 Claims**



1. An electro-acoustic transducer, principally enclosed in a housing, comprising a driving element including a single magnetizable core having one north pole and one south pole that generates usable power producing magnetic energy at both of its poles, where the said core's rearward end produces at least one tenth and not more than seven tenths of the usable magnetic energy as produced by the forward end of said core when said transducer is operating at 400 cycles per second, two electrically parallel coils wound toward the forward end of said core for magnetically actuating said driving element, whereby said coils are supported by said core, wherein said coils are in circuit with and energized by the same electrical power source with one said coil consisting of more turns than the other said coil, wherein the said coil consisting of the least number of turns has electrical current regulating means in series with it, said core being solidly attached toward its rearward end to mounting means providing a magnetic path to said core from magnetic biasing means that will become magnetically pregnant before said core, an armature of magnetizable material for transmitting vibratory motion to a sounding board mounted in axially spaced relation at the forward end of said core, resilient coupling means connecting said armature with said mounting means for permitting relative motion and power transfer between said driving element and said armature element, magnetic biasing means disposed between said mounting means and said armature, wherein separate magnetic pickup means is positioned in proximity to the rearward end of said core for transferring power to energize other apparatus without the use of additional amplifying equipment.

20. An electro-acoustic transducer principally enclosed in a housing comprising a driving element including a single magnetizable core wherein said core is mounted near its rearward end to a magnetic plate with said plate attached to magnetic biasing means, two current carrying coils of wire wound on and mounted toward the forward end of said core with one said coil having no more than one half the turns of wire than the other said coil, wherein said coil with the least number of turns has a capacitor connected in series with it, with said coil having the least number of turns and said capacitor being connected in parallel with said coil having the greater number of turns, wherein said parallel circuit is connected to a signal supplying source where the currents in said coils operate more than ninety degrees and less than one hundred eighty degrees out of phase with each other when said signal source is operating at a position between three hundred and eight hundred cycles per second.

4,151,380

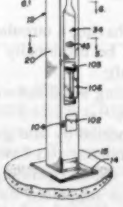
POST MOUNTED PUBLIC TELEPHONE

Earle B. Blomeyer, Atlanta; William O. Watson, Danwoody, and Charles T. Richardson, Jr., Lawrenceville, all of Ga., assignors to Gladwin, Inc., Oakwood, Ga.

Filed Jun. 2, 1978, Ser. No. 911,980

Int. Cl.[2] H04M *1/12, 17/00*

U.S. Cl. 179—148 R **41 Claims**



1. A vandal resistant public telephone installation comprising, in combination,

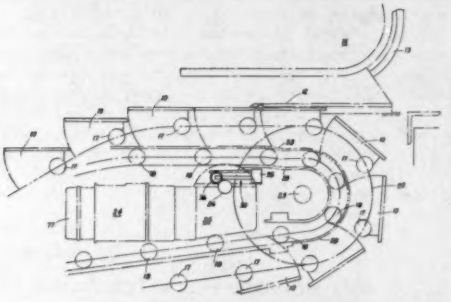
an elongated, upwardly extending support post having a bottom end adapted to be anchored to a floor surface, said post having rigid external walls cooperating to define a hollow interior for housing telephone apparatus,

access opening means in one wall of said post,

coin-operated telephone instrument means mounted within said post, said telephone instrument means having dial actuating means accessible from outside said post through said access opening means,

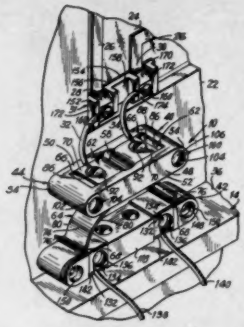
transmitter and receiver means mounted within said post,
means permitting the substantially unobstructed transmission of sound between the exterior of said post and said transmitter and receiver means to enable a person adjacent to the post to use the telephone,
coin collecting means supported within said post at a location spaced substantially below said telephone instrument,
coin guide means extending between said telephone instrument and said coin collecting means for guiding coins which have been employed to actuate said telephone instrument to said coin collecting means, and
door means in an outside wall of said post below said access opening means providing access to said coin collecting means.

4,151,381
REVERSAL STOP DEVICE
Henry J. Holuba, Moline, Ill., assignor to Montgomery Elevator Company, Moline, Ill.
Filed May 25, 1977, Ser. No. 800,163
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.39 **12 Claims**



10. In an endless passenger conveyor having an electrically-operated motor, a shaft rotatively driven by the motor and operatively connected to the conveyor to effect . circuitous movement thereof, and an electric circuit for controlling operation of the motor, a switch mechanism for controlling the energization of said electric circuit in accordance with the rotational movement of the shaft, said switch mechanism comprising in combination:
a switch incorporated in the electric circuit, said switch having an operating member for activating and deactivating said switch;
a rotatable member having a circular surface supported on the shaft so as to be frictionally rotated in response to rotation of the shaft;
guide means for guiding a rod endwise to move said switch operating member;
an actuator rod supported by said guide means for endwise movement, said actuator rod having a first end immediately adjacent the switch operating member and having a second end portion supported on and maintained by its own weight in frictional engagement with the circular surface of the rotating member, whereby rotation of the rotating member in one direction frictionally urges said actuator rod to a normal position against the switch operating member to activate the switch, and rotation of said rotating member in the opposite direction frictionally moves said actuator rod to a release position away from the switch operating member, releasing said operating member and deactivating said switch, and said actuator rod slides on said rotating member in both said positions; and
stop means for limiting the movement of the actuator rod away from the switch operating member.

4,151,382
SWITCH ASSEMBLY FOR ALARM SYSTEMS
Edward Kaufman, 41-27 W. Moreland St., Little Neck, N.Y. 11363; Frank Picciotto, 667 River Vale Rd., River Vale, N.Y. 07675, and Jack Beck, 33 Feller Dr., Central Islip, N.Y. 11722
Filed Nov. 3, 1977, Ser. No. 848,156
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—61.71 **35 Claims**

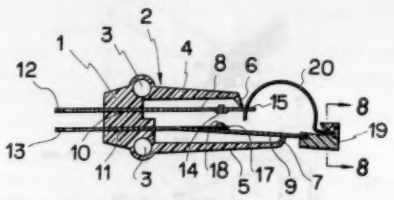


1. A switch assembly for interconnecting foil conductors on a window or other closure member within a burglar alarm system, said switch assembly comprising
a first switch unit capable of being mounted on a closure member,
a second switch unit adapted to be mounted on a fixed surface adjacent to said closure member,
said first switch unit comprising a first housing having oppositely disposed sides and spaced apart surfaces intermediate said sides,
said first housing having a slot extending between said oppositely disposed surfaces intermediate said sides,
first contact means comprising
a pair of spring biased slidable contact elements insulated from one another and extending through said slot at oppositely disposed ends thereof, and
said contact elements each having a fixed end and a curved contact portion,
conducting elements,
coupling means for permitting removable positional securement of respective ones of said conducting elements between respective ones of said fixed ends and said foil conductors,
said second switch unit comprising a second housing,
second contact means fixedly secured to said second housing and comprising a pair of contact members insulated from one another,
means for electrically connecting said second contact means within said burglar alarm system, and
said first and second contact means being constructed for mutual engagement to provide a continuous circuit to said burglar alarm system inclusive of said foil conductors whereby movement of said closure member changes the relative position of said free ends of said contact elements relative to said contact members and upon disengagement thereof activates said burglar alarm system.

4,151,383
LEAF-SPRING SWITCH
Muneyoshi Miyata, Tokyo, Japan, assignor to Mitsuku Denki Kogyo K.K., Tokyo, Japan
Filed May 3, 1978, Ser. No. 902,754
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—67 D **4 Claims**

1. A leaf-spring switch comprising an insulating switch base having upper and lower arms spaced a predetermined distance

apart and provided substantially in parallel with each other, said arms each having a forward-inclined claw on the inside of the free front end thereof, upper and lower leaf springs spaced a predetermined distance apart and provided midway between said upper and lower arms and substantially in parallel with said upper and lower arms, said upper leaf spring being provided at one of its ends with a tongue-shaped projection and a first contact and at its other end with a terminal, said lower leaf-spring being provided at its central portion with a longitudinally-extending finger plate surrounded by a U-shaped slit larger in width than said upper leaf spring, said finger plate having a second contact at its end, said lower leaf spring being



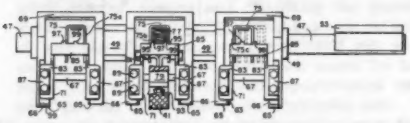
provided at one of its ends with an insulating lug and at its other end with a terminal, said upper and lower leaf springs being fixed at the base section thereof by said switch base so that they may be in the form of cantilevers and so that said first and second contacts thereon may face each other, a toggle spring having a predetermined width and formed of a semicircular plate, said toggle spring being provided at one of its ends with an outward-folded forked part which engages said insulating lug and at its other end with a narrow section of a predetermined length smaller in width than said U-shaped slit of said lower leaf spring, and said narrow section of said toggle spring having a slit which engages said tongue-shaped projection of said upper leaf spring.

4,151,384

MULTI-PHASE SWITCH WITH VARIABLE POLE SPACING

Joseph A. Coffta, Getzville; William P. Heim, Cheektowaga; Thomas A. Wilsdon, Alden, and Glenn A. Barlis, Fairport, all of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1977, Ser. No. 769,599
Int. Cl.[2] H01H *3/00, 1/34*
U.S. Cl. 200—153 R **7 Claims**



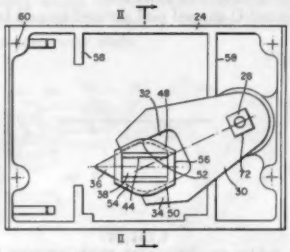
1. A multi-phase switch comprising separable contact means for opening and closing a circuit through each phase, means for operating the contact means and comprising a contact-operating shaft operatively connected to the contact means, means for rotating the operating shaft, the separable contact means comprising a movable contact for each phase, mounting means for each movable contact and comprising a mounting bracket mounted on the operating shaft at a fixed lateral distance from an adjacent mounting bracket, the mounting means comprising a pivot arm pivotable into and out of contact with the mounting bracket and movable laterally on the bracket within spaced lateral limits in a plane normal to the plane of pivot movement, the mounting bracket and the pivot arm having laterally spaced engaging surface means for retaining the movable contact at any desired lateral spacing with respect to an adjacent contact, whereby the movable contacts of adjacent phases are shiftable between variously spaced positions dependent upon the voltage rating of the switch.

4,151,385

TURNING GRIP DRIVE FOR ROCKER-ARM ACTUATED POWER SWITCH

Johannes Neuser, Netphen, and Helmut Menzel, Kreuztal-Ferndorf, both of Fed. Rep. of Germany, assignors to Hundt and Weber, Schaltgerate GmbH, Freudenberg, Fed. Rep. of Germany

Filed Apr. 13, 1978, Ser. No. 895,821
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717113
Int. Cl.[2] H01H *3/04, 3/20*
U.S. Cl. 200—153 LA **8 Claims**



1. A mechanism for actuating a toggle switch or a slide switch whereby the rocking or sliding motion of the switching lever of a power switch is converted, via a shift lever device, into a rotational motion which occupies part of a circle, the said mechanism being characterized by the provision of a plate-shaped coupling member (**36**) with an aperture (**38**) which is matched to the shape of the lever (**16**) of the power switch (**10**), the size of the said aperture increasing from a plane lying within the said plate (**36**) on approaching the outer faces (**40**) of the said plate (**36**), the mechanism being provided with a groove (**46**) located in the peripheral edge of the plate (**36**), the basal surface of the said groove being curved and being abutted against by the internal edges of a plate-shaped lever fork (**34**) which slide in the said groove (**46**), the mechanism also being characterized by the provision of a housing (**24**) which can be mounted on the power switch (**10**) and which is provided with a bearing for a shaft (**28**) which transmits the rotary motion and which is rotatably and firmly fixed by the end stationed within the housing (**24**) to the said lever-fork (**34**).

4,151,386

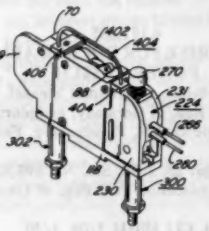
CIRCUIT BREAKER GRIP MEANS

Roland Nicol, deceased, late of Trenton, N.J., and by Helen C. Nicol Robinson, executrix, Tonawanada, N.Y., assignors to Heinemann Electric Company, Trenton, N.J.

Division of Ser. No. 646,988, Jan. 7, 1976, Pat. No. 4,093,838, which is a division of Ser. No. 519,874, Nov. 1, 1974, Pat. No. 3,955,162, which is a division of Ser. No. 384,702, Aug. 1, 1973, Pat. No. 3,863,042. This application Mar. 10, 1978, Ser. No. 885,431
Int. Cl.[2] H01H *9/02*
U.S. Cl. 200—303 **3 Claims**

1. A circuit breaker comprising
a case having a front face,
a handle for operating the mechanism of said circuit breaker, said front face having an opening through which said handle extends,

grip means for facilitating insertion and removal of said circuit breaker and for also guarding said handle, said grip means comprising



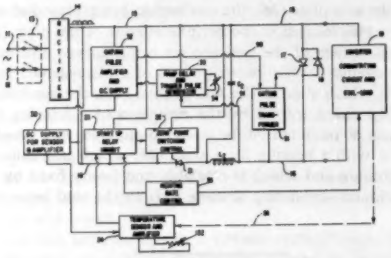
lugs attached to said case, and
an inverted U-shaped pull secured to said lugs.

4,151,387

METAL BASE COOKWARE INDUCTION HEATING APPARATUS HAVING IMPROVED POWER CONTROL CIRCUIT FOR INSURING SAFE OPERATION

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Division of Ser. No. 261,227, Jun. 9, 1972, Pat. No. 3,887,781, which is a division of Ser. No. 131,648, Apr. 6, 1971, Pat. No. 3,710,062. This application Nov. 1, 1974, Ser. No. 520,117
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R **4 Claims**



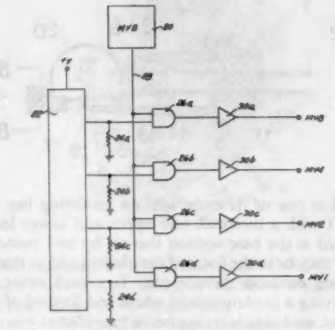
1. An improved power supply circuit and dv/dt control including including in combination, power supply terminal means connected across and supplying a thyristor semiconductor switching device connected in a power supply circuit, a snubbing circuit comprising a series connected resistor and capacitor connected in parallel circuit relationship across the thyristor semiconductor switching device for limiting the rate of rise of reapplied forward voltage across the thyristor semiconductor switching device, circuit means connected to said snubbing circuit for deriving an output dv/dt control signal representative of the rate of rise of reapplied forward voltage across the thyristor semiconductor switching device and means for applying said dv/dt control signal back to control operation of the thyristor semiconductor switching device in a direction to assure safe operation of the power supply circuit within the constraints dictated by the dv/dt characteristics of the thyristor.

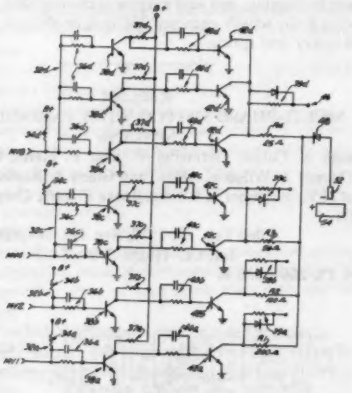
4,151,388

CURRENT CONTROL SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed May 16, 1977, Ser. No. 797,327
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 C **13 Claims**





9. A current control system for electrical discharge machining across a dielectric coolant filled gap, comprising:
a multivibrator for providing a triggering pulse output;
a plurality of independently operable current output modules connected to the gap, each operable with a different weighted current output value;
a gating means connected intermediate the output of said multivibrator and said modules for enabling certain of said modules im accordance with a predetermined assigned weight; and
an encoded switch of the visual readout type for controlling the operation of said gating means in accordance with said assigned weight.

4,151,389

METHOD OF AND APPARATUS FOR WELDING SHEET STEEL PANELS

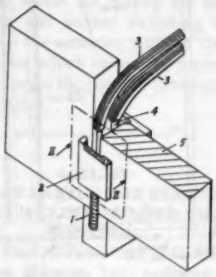
Peter Hirsch, Aachen-Laurenzberg; Bernhard Wibbels, Borken, and Rolf Schäfer, Aachen, all of Fed. Rep. of Germany, assignors to Friedrich Eichhorn, Aachen, Fed. Rep. of Germany

Filed Jan. 26, 1977, Ser. No. 762,689

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603020

Int. Cl.[2] B23K 9/18

U.S. Cl. 219—73.1 7 Claims



1. Apparatus for welding sheet steel panels by submerged arc welding comprising:

(a) means for feeding at least one pair of wire electrodes to a weld gap between adjacent panels;

(b) a power source arranged to feed electrical power to said electrodes;

(c) means for feeding a filler metal powder to said weld gap;

(d) a pair of sliding shoes at opposite sides of adjacent sheet steel panels respectively and adapted to extend across said weld gap and engage the surfaces of said panels at opposite sides of said weld gap;

(e) means for controlling the electrical current and voltage fed to said electrodes and comprising means for receiving reference current and voltage data, comparing said current data with the actual current fed to said electrodes, regulating the speed of said wire electrode feeding means to correct any current deviation, comparing said voltage data with the actual voltage fed to said electrodes and regulating the voltage transmitted by said power source to correct any voltage deviation;

(f) means for maintaining a predetermined ratio of metal powder to consumed wire electrodes fed to said weld gap comprising means for receiving a reference value for said metal powder, sensing and comparing the quantity of metal powder supplied to said weld gap with the quantity of wire electrode consumed at said weld gap and said reference value, and controlling said means for feeding metal powder to maintain said predetermined ratio of metal powder to consumed wire electrodes; and

(g) means for maintaining a predetermined constant distance between the surface of the slag-covered pool formed in said weld gap and the upper edges of said sliding shoes comprising means for sensing the level of said pool and generating a signal in response thereto, and for regulating the speed of said wire electrode feeding means in response to said signal.

4,151,390

TOOL HOLDER HEAD, PARTICULARLY FOR WELDING YOKES AND GUNS

Luciano Bisiach, Strada San Vito Revigliasco N. 350, Turin, Italy

Filed Aug. 4, 1977, Ser. No. 821,735

Int. Cl.[2] B23K 37/02

U.S. Cl. 219—124.10 8 Claims

1. A tool holder head for mounting on machines movable along two or more axes, particularly for supporting a welding yoke or gun for welding sheet metal workpieces for making metal casings and the like, which comprises:

a bushing rigidly mounted on a movable support of said machine;

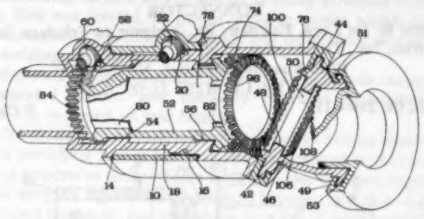
an outer hollow shaft having at one end a first journal bearing arranged at an oblique axis to and intersecting the axis of said shaft;

an intermediate hollow shaft rotatably and coaxially mounted within said outer hollow shaft and having a first bevel gear at the end adjacent said first journal bearing;

an inner shaft rotatably and coaxially mounted within said intermediate hollow shaft and having a second bevel gear at the end adjacent said first journal bearing;

first driving means on said bushing for rotating said outer shaft by desired angular increments with respect to said bushing;

second driving means on said outer shaft for rotating said intermediate shaft by desired angular increments with respect to said outer shaft;



third driving means on said outer shaft for rotating said inner shaft by desired angular increments relative to said outer shaft;

a first driven member rotatably mounted on said first journal bearing and having a third bevel gear meshing with said first bevel gear, said first driven member including a second journal bearing arranged coaxially to said first journal bearing and a third journal bearing having an oblique axis relative to and intersecting the axis of said second journal bearing;

a second driven member rotatably mounted in said second journal bearing and having a fourth bevel gear meshing with said second level gear, said second driven member being further provided with a fifth bevel gear opposed to said fourth bevel gear, and

a third driven member rotatably mounted on said third journal bearing and having a sixth bevel gear meshing with said fifth bevel gear, said third driven member supporting a tool.

4,151,391

CONTACT ARRANGEMENT FOR A PRESSURIZED GAS CIRCUIT BREAKER

Klaus-Peter Rolff, and Heinz-Helmut Schramm, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 794,796

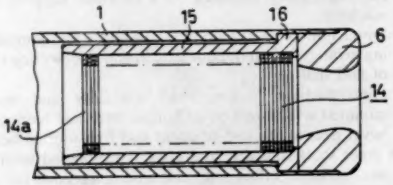
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2624595

Int. Cl.[2] H01H 33/18

U.S. Cl. 200—147 R 6 Claims

1. In a contact arrangment for use in pressurized-gas circuit breakers, the contact arrangement including: a first tubular contact member; a second contact member axially arranged therewith, an arc being drawn between said contact members and blasted by pressurized gas when the breaker is interrupted under load; a nozzle body arranged at the end face of said tubular contact member; and a hollow cylindrical means formed of ferromagnetic material arranged in the interior of said tubular member; the improvement comprising:

said cylindrical means comprising a multiplicity of laminated metal washers which are electrically insulated from one



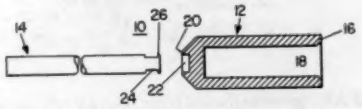
another and are arranged axially with respect to said tubular member.

4,151,392

METHOD OF MANUFACTURING ELECTRICAL CONNECTOR

Carlo B. De Luca, Fairview, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 14, 1977, Ser. No. 777,039
Int. Cl.[2] B23K *33/00*
U.S. Cl. 219—118 **7 Claims**



1. A method of manufacturing an electrical connector, the connector comprising an aluminum barrel member having a first and a second end, with the barrel member having a recess in its first end adapted to receive an electrical cable and a copper lead member extending axially out of its second end, the method comprising the steps of:

forming a second recess in the second end of the barrel member,

forming one end of the copper lead member such that it includes a portion having a reduced cross-sectional area relative to the contact area between the copper lead member and aluminum barrel member,

inserting the one end of the copper lead member into the second recess in the barrel member, and

simultaneously passing electrical current through the copper lead member and the barrel member and applying force to bring the end of the copper lead member into engagement with the bottom of the second recess, whereby greater localized heating of the copper lead member occurs in the portion having a reduced cross-sectional area because of its higher resistance and portions of both copper and aluminum are melted by the passage of the electrical current and a welded metallurgical bond is formed between the barrel member and the copper lead member.

4,151,393

LASER PILE CUTTER

David B. Fenneman, Fredericksburg, VA, and Robert J. Geres, China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

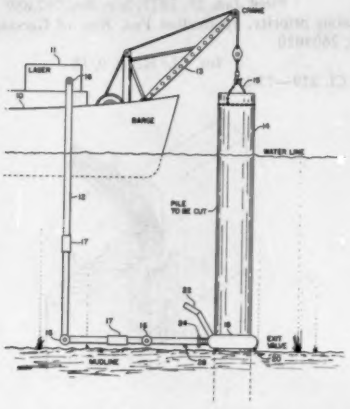
Filed Feb. 13, 1978, Ser. No. 876,953
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **6 Claims**

1. Apparatus for cutting pilings underwater by means of a laser beam comprising;

essentially watertight means for surrounding at least a portion of the piling to be cut;

coupling means associated with said watertight means for coupling conduit means thereto;

said conduit means being capable of carrying a laser beam;



purging means associated with said essentially watertight means for purging water from the interior of said watertight means in communication with the piling to be cut;

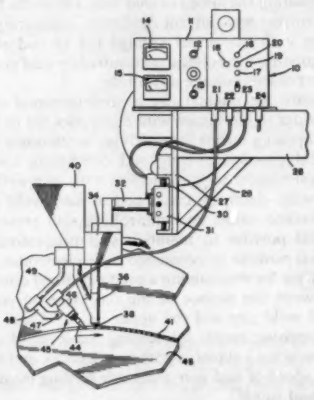
said conduit means also including means for directing a gas jet into the water-free zone to maintain the zone clear of smoke and debris during the cutting operation.

4,151,394

GUIDANCE SYSTEM FOR ARC WELDER

Shelby Cecil, Cleveland, Ohio, assignor to The Cecil Equipment Co., Medina, Ohio

Filed Nov. 5, 1979, Ser. No. 874,153
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—124.34 **4 Claims**



1. A guidance system for a welder having a welding head comprising;

a probe;

said probe including an actuating rod movably mounted therein;

means for movably mounting the probe in the vicinity of the welding head;

first switching means for sensing movement of actuating rod and transmitting a signal to the guidance system, wherein said first switching means includes at least one switch

which is positioned near the actuating rod in the probe in a first plane generally perpendicular to the workpiece in order to signal vertical changes in the workpiece which are sensed by the probe;

a motor operatively attached to the probe and the welding head, wherein said motor has a field coil and circuit means for supplying a constant voltage to the field winding while short circuiting its armature in order to provide dynamic braking;

circuit means for actuating the motor in response to signals from the probe; and

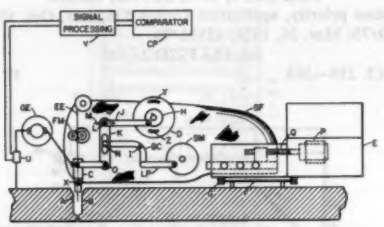
second switching means for biasing the movment of the probe, wherein said second switching means includes switches around the actuating rod and circuit means for driving the motor which moves the probe until pressure on the probe changes the position of switches in the probe and stops the motor.

4,151,395

METHOD AND APPARATUS FOR ELECTRIC ARC AND ANALOGOUS WELDING UNDER PRECISION CONTROL

Cherie E. Kushner; Paul A. Tews, both of Columbus, Ohio, and Jerome W. Nelson, Houston, Tex., assignors to CRC-Crose, International, Inc., Houston, Tex.

Filed Jul. 6, 1976, Ser. No. 702,864
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—125.12 **23 Claims**



1. In apparatus for performing a welding operation on a work member along a predetermined welding course, which apparatus includes a welding instrument capable of generating a characteristic composite signal having a continuous meaningful component which varies dependently with the lateral position of said instrument with respect to said course and a masking component which tends to obscure the meaningful component, said apparatus also including means for causing the instrument to travel with respect to the work member along said course and means to reciprocate the instrument through variably controllable lateral motion transversely of said course and towards and away from an extreme laterally limited position with respect to the welding course, the improved means for controlling position of the instrument with precision which comprises, in combination, the following elements:

(a) Means for isolating said continuous meaningful signal component to obtain signal values representative of intermediate as well as laterally extreme instrument positions,

(b) means for superimposing on the isolated signal values a discontinuous timed signal representative of the instrument being at an extreme lateral position, thereby to obtain a signal surge having a peak or unique value,

(c) means for comparing said peak or unique value with intermediate instrument position signal values to obtain an instrument position-indicating signal, and

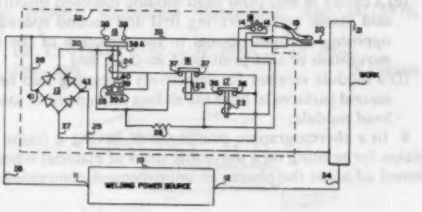
(d) means responsive to said indicating signal for correcting the instrument position when said signal indicates a need for correction.

4,151,396

WELDING CONTROL SYSTEM

Leo D. Veal, 3759 Cottage Hill Rd., Mobile, Ala. 36609

Filed Oct. 11, 1977, Ser. No. 840,587
Int. Cl.[2] B23K *9/10*
U.S. Cl. 219—132 **7 Claims**



1. A welding control system adapted to be located remote from a welding current source and to be solely powered from a pair, first and second, of power welding cables which directly connect to a welding electrode and work piece providing a welding current and comprising:

an electrode holding assembly including an electrode clamp, insulated handle, and manually operated momentary switch mounted on said handle;

an electrically controlled, normally closed switching means for switching power between first and second terminals, and responsive to less than a selected value of signal input for maintaining a closed condition between said first and second terminals, and responsive to a signal input greater than said selected value for switching to an open condition between said first and second terminals;

means for connecting said first welding power cable to said first terminal and for connecting a relatively short power cable between said second terminal and said electrode clamp of said electrode holder;

first signal means coupled to said first welding power cable and to a work piece, connectible to said second welding power cable, and including means for providing a said signal input to said switching means, said signal input being normally, with welding current present, less than said selected value, and with cables energized with a no-load voltage, said signal input being greater than said selected value; and

second signal means including said momentary switch and in circuit with said first signal means for momentarily providing said less than selected value signal to said switching means upon the operation of said momentary switch;

whereby, upon the occurrence of a no-load voltage on and between said first and second welding power cables, all power is removed from said electrode clamp and, selectively, by the operation of said momentary switching, welding power is restored between said electrode clamp and said second power cable.

4,151,397

SELF-ALIGNING THERMAL PRINT HEAD

Robert L. Boor, Jr., St. Petersburg; Robert A. Keller, Seminole, and Donald E. Kesinger, Largo, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

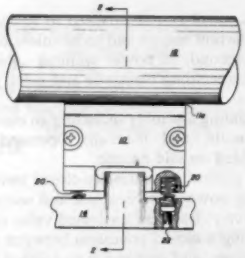
Filed Aug. 12, 1977, Ser. No. 824,212
Int. Cl.[2] G01D *15/10*; **B41J** *11/20*
U.S. Cl. 219—216 **9 Claims**

1. A thermal print head in a thermographic printing unit having a frame and a platen for printing on a movable sheet of thermal sensitive material when disposed adjacent the platen, said print head comprising:

(a) a dot-generating thermal element for floating engagement with the movable sheet of thermal sensitive material when disposed adjacent the platen to selectively generate dots on the sheet;

(b) a print head module rigidly holding said thermal element;
(c) a planar surface on the printing unit frame for slideably supporting the print head module for sliding movement towards and away from the platen;
(d) spring means engaging the print head module at a plurality of positions for biasing said print head module towards the platen;
(e) a cavity in said print head module disposed distally from said planar surface having first and second spaced apart opposing surfaces normal to the direction of the sliding movement of said print head module; and
(f) a module retainer for selectively engaging said first and second surfaces to limit the sliding movement of said print head module.

9. In a thermographic printing unit having a frame and a platen for printing on a moveable sheet of material when positioned adjacent the platen, an improvement comprising:



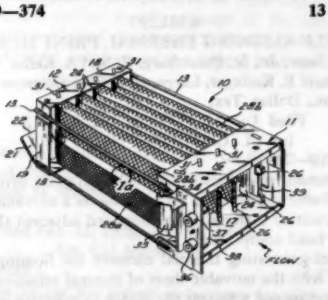
(a) a print head module slideably mounted on the frame for independent sliding motion towards and away from the platen;
(b) a plurality of springs mounted on the frame for engaging said print head module at spaced apart positions for biasing said print head module towards the platen;
(c) said print head module including first and second stop surfaces oriented normal to the direction of the sliding motion;
(d) a modular retainer mounted between said springs for selectively engaging the first and second stop surfaces to limit the sliding motion of said print head module and for allowing pivotal motion of said print head module in a plane; and
(e) a thermal element mounted in said print head module for engagement with the moveable sheet of material in a floating relationship when the sheet is positioned adjacent the platen.

4,151,398

CLOTHES DRYER HEATING UNIT

Douglas H. Manke, Cookeville, Tenn., assignor to Gould Inc., Cleveland, Ohio

Filed Jul. 31, 1975, Ser. No. 600,267
Int. Cl.[2] F24H *3/04*; F26B *11/00*; H05B *3/12*
U.S. Cl. 219—374 **13 Claims**



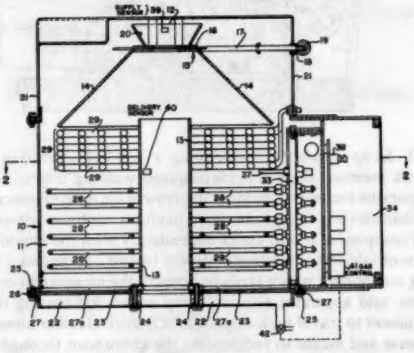
12. A forced convection electrical resistance heater assembly comprising a support frame defining an inlet and an outlet having substantially equal cross sectional areas, a plurality of insulator blocks mounted at the inlet and outlet, a pair of strips of resistance metal expanded foil strung in a sinuous path over said insulator blocks, said insulator blocks being arranged to support each of said strips as serially connected reaches in a plurality of longitudinal, generally parallel planes, said strips each having a width equal to at least a major portion of one-half of one dimension of said cross sectional area, said strips each having one end connected to a separate terminal and having an opposite end connected to that of the other, each of said strips in a given longitudinal plane having its grain running in a direction opposite to that of the other, said frame being constructed and the strips of each plane being supported thereby in a manner permitting the air flowing through each strip to freely mix and intermingle with the air flowing through the other strip due to the turbulence created by the opposite strip grain orientation, and deflector means at said outlet, said deflector being inclined with respect to the net flow direction through the assembly and extending from one edge of the cross sectional area inwardly to form a projection substantially midway across said cross sectional area to intermix the portion of air passing through the zone of one of said strips with that of the other to improve the temperature uniformity of air leaving said assembly.

4,151,399

HEAT EXCHANGE UNITS

David W. B. Beale, Leicester, England, assignor to Marwin (Holdings) Limited, Leicester, England

Filed Oct. 8, 1976, Ser. No. 730,868
Claims priority, application United Kingdom, Oct. 10, 1976, 44050/75; Mar. 26, 1976, 12172/76
Int. Cl.[2] F27D *13/00*
U.S. Cl. 219—385 **17 Claims**



1. A heat exchange unit for the delivery on intermittent demand of particulate material of low thermal conductivity comprising means defining a reservoir for particulate material comprising a base portion, upstanding side portions, and a top closure, said base portion being gas permeable, said reservoir having an inlet for supply of particulate material thereto, said reservoir also having an outlet for delivery of particulate material therefrom, means for supplying gas to the reservoir through the gas permeable base portion to fluidise the particulate material therein, at least one heat transfer member in said reservoir having a surface arranged to be in heat exchange relationship with the particulate material, means for connecting the heat transfer member to an energy source for varying the temperature of said surface, and means operable synchronously with cessation of delivery of particulate material from the reservoir outlet to reduce the gas supply to the said reservoir to an amount insufficient to fluidise the particulate material in the reservoir, whereby the bulk of the particulate mate-

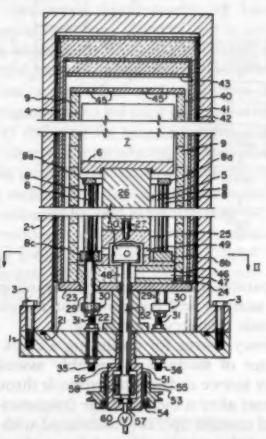
rial remaining in said reservoir is thermally insulated from the heat transfer member by the low thermal conductivity of the particulate material adjacent the heat transfer member, and with recommencement of delivery of the particulate material to the reservoir outlet to restore the gas supply to an amount sufficient for fluidisation, whereby the particulate material then delivered is at substantially the same temperature as the particulate material delivered prior to the gas supply reduction and restoration.

4,151,400

AUTOCLAVE FURNACE WITH MECHANICAL CIRCULATION

Charles W. Smith, Jr., Fairview; William H. Walker, and Franz X. Zimmerman, both of Erie, all of Pa., assignors to Autoclave Engineers, Inc., Erie, Pa.

Filed Jun. 15, 1977, Ser. No. 806,732
Int. Cl.[2] B29C *3/00*; B22F *3/14*
U.S. Cl. 219—400 **3 Claims**



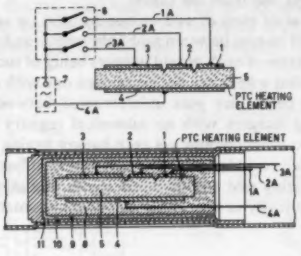
1. An apparatus for gas pressure bonding, hot isostatic pressing or the like in which a workpiece may be treated at elevated temperatures and pressures, said apparatus comprising an elongate cylindrical pressure vessel, a furnace bottom and an insulating hood resting upon the furnace bottom for enclosing the workpiece and a hearth upon which the workpiece rests, the improvement comprising an elongate cylindrical refractory pedestal extending upward from the furnace bottom, a hearth set upon said refractory pedestal, a cylindrical heating element disposed about and substantially along the entire length of said pedestal below said hearth, a cylindrical shield disposed about the pedestal and heating element at least along the entire length of the pedestal, said pedestal having an impeller chamber adjacent the base thereof with radial exhaust ports extending therefrom and an impeller positioned in said chamber having a downwardly extending drive shaft, whereby the vessel atmosphere may be circulated around the cylindrical shield such that convection transfers heat from the heating element to the workpiece.

4,151,401

PTC HEATING DEVICE HAVING SELECTIVELY VARIABLE TEMPERATURE LEVELS

Andre M. A. Van Bokestal, and Charles J. G. Belhomme, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,968
Claims priority, application Netherlands, Apr. 15, 1976, 7603997
Int. Cl.[2] H05B *1/12, 3/24*; H01C *1/14, 7/02*
U.S. Cl. 219—508 **6 Claims**



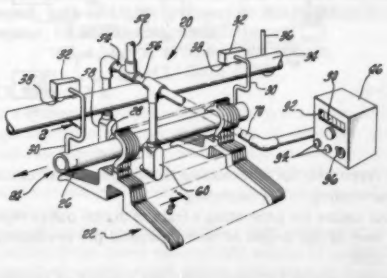
1. A heating device comprising a resistance body having two opposite boundary surfaces and made of a material having a positive temperature coefficient of resistance and provided with at least three electrodes, one of the boundary surfaces being provided with a first electrode which covers a major part of the surface area of said one boundary surface and the other boundary surface including at least two other electrodes which together cover a major part of the surface area of said other boundary surface thereby to provide at least two parallel current paths in the resistance body between said opposite boundary surfaces, means connecting at least said first electrode of the resistance body to one terminal of a voltage source, and a switching device for selectively connecting one or more of said other electrodes to the other terminal of the voltage source so as to selectively alter the relative effective electrode surface areas so that the heat developed in the resistance body is dependent on the electrodes selectively energized by the switching device.

4,151,402

SYSTEM AND APPARATUS FOR COUNTING HANGING GARMENTS

Eugenio A. Fernandez, 95 S. San Gabriel Blvd., Pasadena, Calif. 91107, and Edward E. Chisholm, 79 E. Highland Ave., Sierra Madre, Calif. 91024

Continuation of Ser. No. 700,484, Jun. 28, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,533
Int. Cl.[2] G06M *7/00*
U.S. Cl. 235—92 PK **22 Claims**



1. A system for electronically counting garments suspended

from unique hangers by counting said hangers where said hangers are hung on a rack comprising:

a scanner totalizer including a light source adapted to emit a light beam, a receiver means receiving said beam, an on/off electronic amplifier means connected to said receiver, an electronic event counter connected to said amplifier means to register a numerical count when said light beam is intercepted and said amplifier means is activated and a power source adapted to power said scanner totalizer;

said light source and said receiver are coaxially aligned and spaced one from the other;

a portion of each of said unique hangers on said rack positioned to pass between said light source and said receiver;

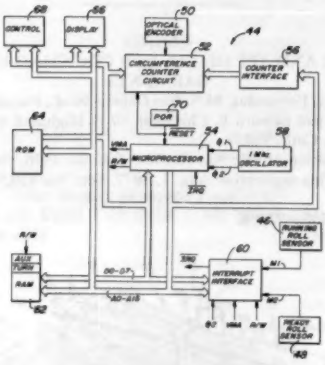
said portion of each of said hangers being of such a construction that when they are juxtaposed one with the other said light beam may pass uninterrupted between said juxtaposed hangers with no numerical registry in said electronic event counter yet each hanger having a part of said portion capable of interrupting said light beam and in turn activating said amplifier and registering said interruption numerically in said electronic event counter.

4,151,403

CONTROL SYSTEM FOR AN UNWINDING ROLL

Allan B. Woolston, Wynnewood, Pa., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Oct. 5, 1977, Ser. No. 839,680
Int. Cl.[2] G06M *3/02*; B65H *19/08*
U.S. Cl. 235—92 DN **17 Claims**



1. Apparatus for determining the length of web remaining on an unwinding roll, comprising:

first means for generating a train of digital pulses representative of the length of web unwound per revolution of the roll;

second means for monitoring the number of revolutions of the roll;

third means operatively associated with said first and second means for accumulating successive counts of said pulses over a predetermined number of revolutions of the roll;

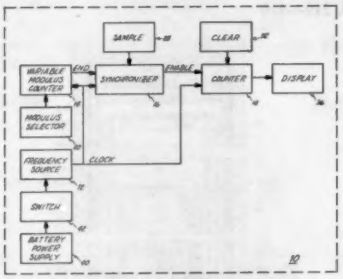
fourth means operatively associated with said first, second and third means for computing the average change in the number of said pulses generated per revolution of the roll over a predetermined number of revolutions of the roll and for computing the length of web remaining on the roll after each revolution thereof based on said computed average change and the accumulated counts of said pulses.

4,151,404

RANDOM DIGIT GENERATOR

Timothy M. Harrington, and Steven M. Harrington, both of Sierra Madre, Calif., assignors to MDH Industries, Inc., Monrovia, Calif.

Filed Oct. 31, 1977, Ser. No. 847,395
Int. Cl.[2] H03K *21/32*
U.S. Cl. 235—92 GA **10 Claims**



1. In an apparatus for the generation of random digits for use in statistical analysis and entertainment activities, improved digital electronic circuitry comprising:

(a) a frequency source for producing a clock signal;

(b) a counter of modulus n operably associated with the frequency source and adapted to cycle through a sequence that repeats after n cycles of the frequency source;

(c) a second counter operably associated with the frequency source and the counter of modulus n, the second counter counting the number of clock pulses determined by the counts through which the counter of modulus n must cycle before reaching a defined end state;

(d) a synchronizer operably associated with the frequency source, the counter of modulus n and the second counter, the synchronizer being adapted to enable the second counter during one cycle more than the number of cycles of the frequency source that occur between activation of the synchronizer and a defined state of the counter of modulus n, whereby the second counter is enabled to count frequency source cycles for a number between 1 and n, inclusive, depending on the time of activation of the synchronizer relative to the occurence of the defined state of the counter; and

(e) a sample circuit operably associated with the synchronizer, the sample circuit arranged to activate the synchronizer at an undetermined or random state of the counter of modulus n whereby the number of cycles of the frequency source counted by the second counter represents a random sample of the digits 1 to n.

4,151,405

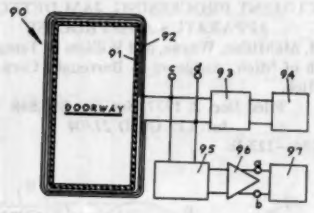
FERROMAGNETIC MARKER PAIRS FOR DETECTING OBJECTS HAVING MARKER SECURED THERETO, AND METHOD AND SYSTEM FOR ACTIVATING, DEACTIVATING AND USING SAME

Glen Peterson, 540 S. 83rd E. Ave., Tulsa, Okla. 74112

Filed Jun. 24, 1976, Ser. No. 699,523

Int. Cl.[2] G06K *5/00, 19/06;* **G08B** *13/26;* **H04B** *7/14*

U.S. Cl. 235—382 **22 Claims**



11. A system for detecting a characteristic of an object when said object is in an interrogation zone having a magnetic field periodically varying at a predetermined fundamental frequency, said system comprising:

Marker means for being secured to an object comprising a pair of identical ferromagnetic elements capable of generating a detectable signal containing harmonics of said fundamental frequency when placed in said zone, said pair of identical elements having two states of magnetization, a first of said two states having said elements magnetized in opposition, a second of said two states having said elements magnetized to aid each other, said signal generating capability differing for two said states of magnetization;

Radiating means for producing within said interrogation zone said periodically varying magnetic field;

Receiving means for detecting the harmonic content of the signal produced by said elements; and

Security readout and communication means coupled to said receiving means responsive to said signal to indicate said characteristic of an object in accordance with said harmonic content.

4,151,406

Patent Not Issued For This Number

4,151,407

LOW-POWER, INFRARED INFORMATION TRANSMISSION SYSTEM

Lyle E. McBride, Norton; Richard G. Delagi, Sharon, both of Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 28, 1977, Ser. No. 791,898

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **11 Claims**

1. An infrared information transmission system comprising:

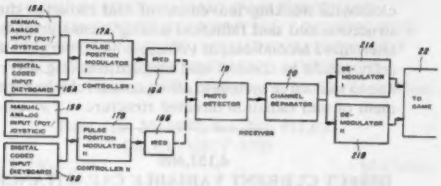
(a) a low-power portable transmitter module including:

(i) data input means for receiving an input signal representative of data to be transmitted;

(ii) battery means for providing power from a battery source to power said transmitter module;

(iii) a pulse position modulator circuit coupled to said data input means, said pulse position modulator circuit including timing means for generating pulses controllably positioned in time, within a predetermined modulation range from a reference frequency in dependence upon said input signal; and

(iv) an infrared light-emitting device coupled to said pulse position modulation circuit for receiving pulses generated thereby, said light-emitting device generating infrared energy bursts in synchronism with the pulses generated by said modulator circuit; and



(b) a receiver module including:

(i) an infrared photodetector device for altering an electrical signal in accordance with received bursts of infrared energy generated by said light-emitting device to provide an electrical signal pulsed in synchronism with said bursts;

(ii) a demodulator circuit coupled to said photodetector device for generating an output signal indicative of the deviation of the pulses of said electrical signal from said reference frequency; and

(iii) means coupled to said demodulator circuit, said means being controlled by said output signal.

4,151,408

SUN TRACKING CONTROL SYSTEM

Russell L. Brown, Oklahoma City, and Charles M. Burton, Edmond, both of Okla., assignors to Brown Manufacturing Company, Oklahoma City, Okla.

Filed Mar. 5, 1976, Ser. No. 664,261

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—203 R **10 Claims**

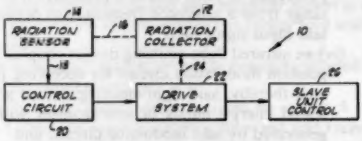
1. In a system of the type which tracks point source radiation through incremental drive adjustment of radiation directed structure, an improved electrical control system comprising:

a drive system connected to provide intermittent clockwise and conterclockwise movement to said radiation directed structure;

threshold sensing means which is a light responsive element shielded from direct view of said source of radiation and providing output signal that is indicative of presence or absence of sufficient ambient light level;

amplifier means connected to receive said threshold sensing means output signal and energized in response to output signal indicating presence of sufficient light level to effect actuation of a first relay means which enables a tracking drive voltage; and

radiation sensing means providing a first output voltage which energizes a second relay means to apply said enabled tracking drive voltage to said drive system for clockwise tracking movement of said radiation directed structure, and said radiation sensing means providing an alternative second output voltage which energizes a third relay means to connect said enabled tracking drive voltage to said drive system to effect counterclockwise movement of said radiation directed structure.



4,151,409

DIRECT CURRENT VARIABLE CAPACITANCE ELECTRIC GENERATOR

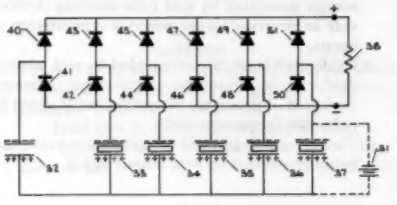
Louis R. O'Hare, 1041 Ponderosa #2, Fort Collins, Colo. 80521

Filed Jan. 21, 1977, Ser. No. 761,456

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] **H01J** *39/12*

U.S. Cl. 250—212 **8 Claims**



1. A method of generating direct current electricity from radiant energy by means of radiation variable capacitance by:

periodically directing radiation on a radiation sensitive dielectric material whose effective dielectric constant changes under the influence of incident radiation,

placing an electric charge on said radiation-variable capacitor and removing the source of the charge,

employing said radiation-variable capacitor in an electric circuit comprising two rectifiers, and an electric load resistance and two fixed condensers in such a manner that the initial charge on the variable capacitor is distributed through a rectifier to one fixed condenser as well as through that rectifier and through a load resistance to the other fixed condenser, all three condensers having a common connection on their plates opposite the rectifier connections and,

employing the alternate voltage elevations and depressions from the activated radiation-variable condenser in such a way that, when that condenser's voltage is elevated by having its capacity reduced, the rectifiers connected to its terminal will allow the current flowing from it to move in only one direction as it elevates the voltage on the two fixed capacitors, one rectifier functioning to conduct current at this time with the second rectifier functioning during a subsequent period of depressed voltage on the radiation-variable capacitor to admit current from the fixed condensers which at that time will have higher voltage than the radiation-variable capacitor will have, providing for an isolation of the total distributed charge by insuring that no resistance is connected across any condenser or group of condensers sharing the total charge, periodically restoring any of the isolated charge which may have leaked off of the condensers by occasionally connecting the power supply and then removing it,

utilizing electric power from a one direction current flow through the load resistance from which useful work energy is extracted.

4,151,410

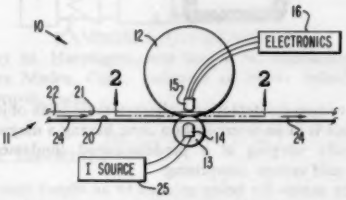
DOCUMENT PROCESSING, JAM DETECTING APPARATUS AND PROCESS

Andrew H. McMillan, Wayne, and William B. Templeton, Howell, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,848

Int. Cl.[2] **G01D** *21/04*

U.S. Cl. 250—223 R **25 Claims**



1. An apparatus for detecting a document jam in a system that moves documents, said documents having first and second broad, opposite surfaces; said apparatus comprising:

means located adjacent the first surface of said moving document for illuminating at least a portion of said moving document;

means located adjacent the opposite surface of said moving document for detecting the magnitude of light that passes through translucent portions of the document as it is between said illuminating means and said detecting means; and

electronic means connected to said detecting means for indicating a document jam when the translucency of said document is generally unchanged for a period of time while the document is between the illuminating means and the detecting means.

4,151,411

LASER SAFETY GOGGLES

George Derderian, Maitland, and Windell N. Mohon, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1978, Ser. No. 876,373

Int. Cl.[2] **G01J** *1/20*

U.S. Cl. 250—225 **31 Claims**

1. An automatic adjustable radiant energy filter system for controlling the intensity of a predetermined radiant energy passing therethrough, comprising in combination:

a normally open optical shutter means perpendicularly disposed with and on a predetermined optical axis adapted for receiving and selectively passing said predetermined radiant energy therethrough along said predetermined optical axis;

first optical polarizer means spatially located downstream from said normally open optical shutter in perpendicular disposition with and on said predetermined optical axis;

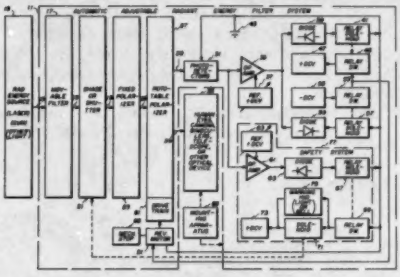
second optical polarizer means adapted for being relatively rotated with respect to said first optical polarizer means, with said second optical polarizer means located down-

stream from said first optical polarizer means in perpendicular disposition with and on said predetermined optical axis;

reversible motor means effectively connected to said rotatable second optical polarizer means for the driving thereof in either a clockwise or counterclockwise direction with respect to said first optical polarizer means;

photodetector means spatially disposed downstream from said second optical polarizer means;

negative feedback control means connected between the output of said photodetector means and the input of said



reversible motor means for effecting the rotation of the aforesaid second optical polarizer means in such manner as to control the intensity of said predetermined radiant energy passing therethrough and through said first optical polarizer means at a first preset level; and

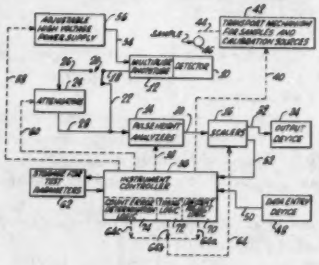
means connected between the output of said photodetector means and the aforesaid normally open optical shutter means for effecting the closure thereof whenever the intensity of said predetermined radiant energy received by said photodetector means exceeds a second preset level that is a predetermined amount greater than the aforesaid first preset level.

4,151,412

METHOD AND APPARATUS FOR AUTOMATIC SPECTRUM SCANNING IN A PROPORTIONAL COUNTER

Clement P. Aime, Mission Viejo, and Donald L. Horrocks, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 22, 1976, Ser. No. 734,931
Int. Cl.[2] G01T 1/00
U.S. Cl. 250—328 **11 Claims**



1. For use in a proportional counting instrument, a method of deriving an energy spectrum relating to a sample of radioactive material, comprising the steps of:

counting pulses over a selected narrow energy range or window for a time interval which is determined in part by the count rate measured in that window; and

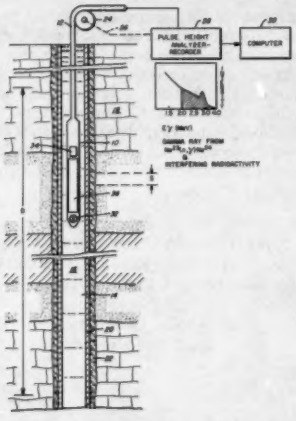
successively changing the parameters of the window in which counting is performed, in order to scan the energy spectrum.

4,151,413

METHOD OF MEASURING HORIZONTAL FLUID FLOW BEHIND CASING IN SUBSURFACE FORMATIONS WITH SEQUENTIAL LOGGING FOR INTERFERING ISOTOPE COMPENSATION AND INCREASED MEASUREMENT ACCURACY

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,023
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—270 **16 Claims**



1. A method for determining the location and flow rate of earth formation fluids moving in a horizontal direction past a casing in a well borehole in a formation interval of interest comprising the steps of:

(a) irradiating the earth formation interval of interest during a plurality of sequential irradiation passes with fast neutrons for a predetermined length of time to neutron activate elements in the formation and casing and at least one selected tracer element in the earth formation fluid moving past the well borehole;

(b) detecting gamma radiation during a plurality of sequential counting passes to obtain count rate signals representative of gamma radiation caused by the radioactive decay of elements in the formation, casing and the selected tracer element in the earth formation interval of interest;

(c) measuring the time intervals during which the count rate signals are obtained during said step of detecting; and

(d) obtaining, from the count rate signals and the measured time intervals the flow speed of the fluid, a measure of the amount of gamma radiation attributable to elements in the formation and the casing and a measure of the amount of gamma radiation attributable to the tracer element in the fluid.

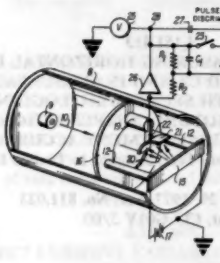
4,151,414
METHOD AND APPARATUS FOR DETECTION OF EXTREMELY SMALL PARTICULATE MATTER AND VAPORS

Wade L. Fite, and Richard L. Myers, both of Pittsburgh, Pa., assignors to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 711,231, Aug. 3, 1976, Pat. No. 4,093,855, which is a continuation of Ser. No. 465,136, Apr. 29, 1974, Pat. No. 3,973,121, which is a continuation-in-part of Ser. No. 319,442, Dec. 29, 1972, Pat. No. 3,808,433. This application Mar. 31, 1977, Ser. No. 783,323

Int. Cl.[2] H01J *39/34;* B01D *59/44*

U.S. Cl. 250—281 19 Claims



1. A method for detecting and measuring particulate matter which comprises the impinging of said particulate matter upon a hot surface whereupon said individual particulates of said particulate matter decompose at the high temperature of the heated surface into fragments, at least some of said fragments being surface ionizable by said hot surface evolving therefrom as bursts of ions, and discerning said bursts of ions so produced by the simultaneous counting of said bursts of ions and the measuring of total current produced thereby.

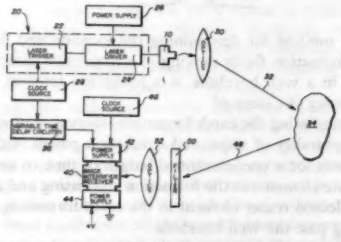
4,151,415
ACTIVE IMAGING SYSTEM USING VARIABLE GATE WIDTH TIME PROGRAMMED DWELL

Donald L. Lipke, Garland, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Oct. 31, 1977, Ser. No. 847,032

Int. Cl.[2] H01J *31/49*

U.S. Cl. 250—333 13 Claims



1. An imaging system for detection of a target comprising:

an electromagnetic radiation source for generating a series of interrogating pulse signals directed towards the target;

receiver means operable to be triggered for receiving during variable range windows reflected interrogating pulse signals from the target and for generating a resultant output signal; and

circuit means connected for triggering the initiation of said variable space windows of said receiver means according to a variable delay function such that the number of reflected interrogating pulse signals received by said receiver means is dependent on the distance between said receiver means and the target, said receiver means thus generating a resultant output signal to provide a signal of constant amplitude independent of the distance between said receiver means and the target.

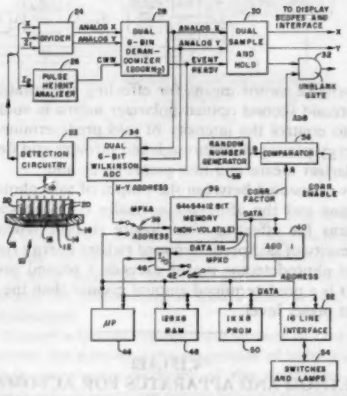
4,151,416
DYNAMIC UNIFORM FLOOD CORRECTION FOR RADIOISOTOPE CAMERAS

Joseph B. Richey, Shaker Heights; Robert H. Wake, Warrensville Heights; Henry H. Wilson, Solon, and Michael C. Cheiky, Hiram, all of Ohio, assignors to Ohio-Nuclear, Inc., Solon, Ohio

Continuation of Ser. No. 684,241, May 7, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,351

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—363 S 18 Claims



1. A radiation sensing device comprising:

a radiation camera including scintillator means for converting radiation to light flashes and an array of photosensitive means viewing said scintillator means for converting said light flashes to a plurality of electrical signals indicative of the energy and location of the radiation;

detection circuit means responsive to said plurality of electrical signals from said camera for producing a pair of analog x,y coordinate values indicative of the location of a valid radiation event;

memory means for storing a plurality of correction factors between 0 and n corresponding to a predetermined plurality of locations;

means for using the x,y coordinate values from said detection circuit means to retrieve the corresponding correction factor from said memory means;

means for generating random numbers selected from between 0 and n;

comparator means for comparing the corresponding correction factor retrieved from said memory means with the number generated by said random number generating means to produce an output indicative of whether said correction factor has a predetermined relationship with said random number;

display means responsive to said analog x,y coordiante values for displaying a valid event at a location corresponding to said analog x,y coordinate values; and

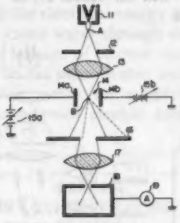
gate means for controlling said display means in accordance with the output of said comparator means.

4,151,417

ELECTRON BEAM EXPOSURE APPARATUS

Tadahiro Takigawa, Inagi, Japan, assignor to Vlsi Technology Research Association, Japan

Filed Mar. 31, 1978, Ser. No. 892,128
Claims priority, application Japan, Mar. 31, 1977, 52-36650
Int. Cl.[2] G21K *1/08*
U.S. Cl. 250—396 R 7 Claims



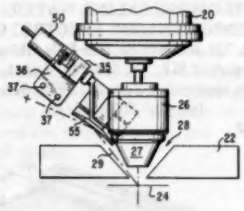
1. An electron beam exposure apparatus comprising an electron beam emitter means, an electrostatic deflecting device so disposed that the center thereof in the direction of the passage of an electron beam emitted from said means is located on the crossover point of said beam, a variable voltage power source for applying voltage to said electrostatic deflecting device and deflecting said electron beam, and an aperture means disposed in the path of the deflected electron beam.

4,151,418

MULTIPLE CRYSTAL HOLDER ASSEMBLY FOR WAVELENGTH DISPERSIVE X-RAY SPECTROMETERS

Bela Kenessey, Burbank, Calif., assignor to Bausch & Lomb, Inc., Rochester, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,444
Int. Cl.[2] H01J *37/20*
U.S. Cl. 250—442 4 Claims



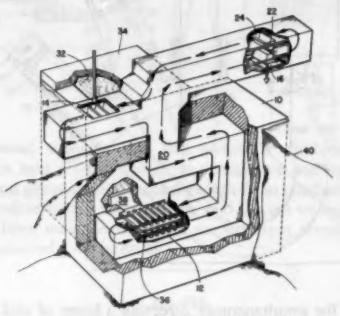
1. An electron probe X-ray analyzer having a specimen stage; a source of electrons; means for focusing electrons from said source into a beam impacting material disposed on said stage including an objective magnetic lens having a gap; a cylindrical optical viewing assembly coaxial with the electron beam path and having a conical portion extending within the gap of the magnetic objective lens; a crystal orienting mechanism including means for moving a crystal along a path at an acute angle to the electron beam path for varying the Bragg angle of said crystal and a crystal holder comprising a base member adapted to be secured to said crystal orienting mechanism, a shaft rotatably mounted on said base member, a cylinder segment carried by said shaft coaxially therewith and having a concave portion movable into partially encompassing relationship with said viewing optics assembly, a plurality of crystal holders mounted on the convex surface of said cylinder segment and a stepping motor carried by said base and driving said shaft.

4,151,419

SOLIDS IRRADIATOR

Marvin E. Morris; Jim D. Pierce, and Willis J. Whitfield, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 20, 1977, Ser. No. 844,085
Int. Cl.[2] G01N *21/00*; G01N *23/00*
U.S. Cl. 250—453 6 Claims



1. A facility for gamma irradiation or sterilization of solids embodying pathogens comprising; an underground structure of concrete having an irradiation chamber, an inlet opening above and spaced from said chamber, a barrier portion of concrete intermediate said chamber and inlet opening, and a communicating passageway interconnecting said chamber and inlet opening at an end portion of said barrier and out of direct alignment with said chamber and inlet opening; an endless conveyor carrying individual open top containers along its length extending through said chamber and passageway and inlet opening having a plurality of spaced apart lengths one above the other disposed in said chamber and having an outer portion with upper loading and lower discharging lengths disposed above said concrete structure and irradiation chamber for receiving untreated solids through said open tops and discharging treated solids through said open tops by inverting said containers, said conveyor comprising an endless foldable chain with means for moving said containers into close adjacency disposed in said irradiation chamber and in said upper loading length; a concrete cavity portion at one side of said irradiation chamber for containing a water pool and an irradiation source and having a delivery port adjacent said irradiation chamber, and means for transferring an irradiation source through said port from said cavity portion to an irradiating position in said irradiation chamber adjacent said conveyor and intermediate said upper and lower conveyor lengths to irradiate or sterilize solids carried in said individual containers from their tops during movement in one direction and from their bottoms during movement in an opposite direction.

4,151,420

APPARATUS FOR THE FORMATION OF EPITAXIAL LAYERS DOPED WITH CONDUCTIVITY-DETERMINING IMPURITIES BY ION DEPOSITION

John H. Keller, Newburgh; Charles M. McKenna, Fishkill, and James R. Winnard, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

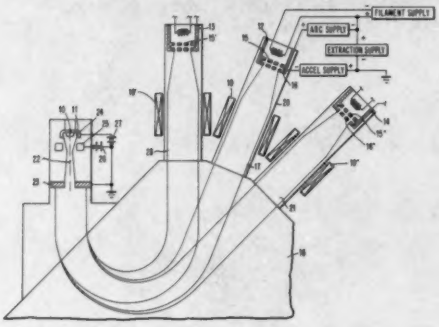
Filed Dec. 8, 1977, Ser. No. 858,486
Int. Cl.[2] A61K *27/02*
U.S. Cl. 250—492 A 18 Claims

1. In equipment for applying a beam of selected ions to a substrate, apparatus for applying a thin layer of semiconductor material containing selected conductivity-determining impurities onto said target comprising

mass separating means,

a source of said semiconductor ions having a multi-apertured exit plate,

means for extracting said semiconductor ions through said exit plate and directing said extracted ions into said mass separating means,



means for simultaneously directing a beam of said selected conductivity-determining impurities into said mass separating means,

said mass separating means being adapted to provide a beam of ions of said semiconductor material directed at a surface of said target and to simultaneously provide a beam of ions of said conductivity-determining impurities directed at at least a portion of said target surface.

4,151,421

METHOD FOR COMPRESSING PATTERN DATA AND DATA COMPRESSION PROCESSING CIRCUIT FOR RADIANT BEAM EXPOSURE APPARATUSES

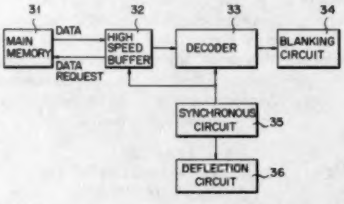
Masahiko Sumi, Yokohama, Japan, assignor to Vlsi Technology Research Association, Japan

Filed Jan. 31, 1978, Ser. No. 873,890

Claims priority, application Japan, Jan. 31, 1977, 52-8805

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 A **9 Claims**



1. A method for compressing pattern data for use in a radiant beam exposure apparatus depicting a specified pattern by means of numerous scanning lines comprising:

a preparing a plurality of pattern data trains which correspond respectively to a plurality of scanning lines and which are each comprised of at least one data-element group composed of consecutive data elements having the same contents, and

b. coding said data-element group into a code corresponding to the number of the consecutive data elements.

4,151,422

ELECTRON BEAM EXPOSURE METHOD

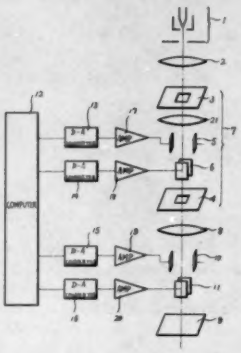
Eiichi Goto, Fujisawa; Takashi Souma, Kiyose; Masanori Idesawa, Wako, and Tetsuo Yuasa, Akishima, all of Japan, assignors to Rikagaku Kenkyusho, Saitama and Nihon Denshi Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 7, 1978, Ser. No. 913,397

Claims priority, application Japan, Jun. 30, 1977, 52-78189

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 A **7 Claims**



1. An electron beam exposure method for projecting an electron beam having a selectable cross section onto a workpiece, said method comprising the steps for:

A. controlling the electron beam to produce an elongate rectangular cross section,

B. projecting said electron beam onto a workpiece,

C. deflecting said projected electron beam over the workpiece, and

D. varying the length of the cross section of the beam in accordance with the pattern to be exposed and concomitant with the deflection of the electron beam.

4,151,423

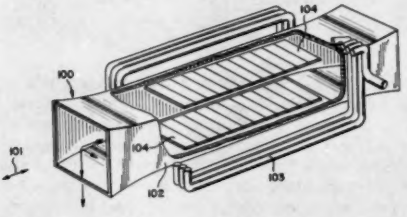
FLOWING SALINE WATER MAGNETOHYDRODYNAMIC ELECTRIC GENERATOR

Frank J. Hendel, 721 Johnson St., San Luis Obispo, Calif. 93401

Continuation-in-part of Ser. No. 783,549, Apr. 1, 1977, Pat. No. 4,110,630. This application Jun. 27, 1978, Ser. No. 919,470

Int. Cl.[2] F03B *13/12*

U.S. Cl. 290—42 **23 Claims**



1. A flowing saline sea water MHD electric generator comprising:

a duct for the channelization of conductive flowing saline water;

means applying a magnetic field orthogonal to the longitudinal axis of the duct;

electrode means positioned orthogonally to both the magnetic field and the flow of water through the duct, and in contact with the flowing conductive saline water therein such that the electrode means receives at least some of the

electrical energy generated as the sea ebbs and flows and the conductive flowing saline water passes through the magnetic field;

means to augment the flow of sea water thru the duct in synchronization with wave flow past the duct, thereby to increase the generated electrical energy;

buoying and anchoring means for holding the duct just beneath the surface of the water;

means connected to the electrode means for both rectifying and condensing the electrical energy generated by motion of the flowing saline water through the magnetic field;

means to prevent leakage of electric current from the condensing means to the saline water; and

power transmission means for supplying the generated, rectified, and condensed electric energy to an external electrical load.

4,151,424

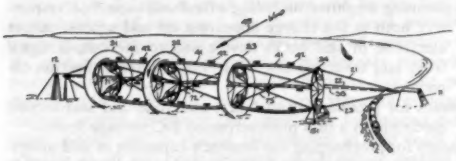
APPARATUS FOR UTILIZATION OF ENERGY FROM FLUIDS

David Z. Bailey, 214 Bowen St., Providence, R.I. 02906

Filed Feb. 18, 1977, Ser. No. 770,120

Int. Cl.[2] F03B *13/05*

U.S. Cl. 290—54 **24 Claims**



1. An apparatus for withdrawing useful energy from a fluent medium, the apparatus comprising

at least two spaced-apart supports;

a plurality of tension members spanning the distance between the supports;

foil members attached to the tension members over at least a portion of the span of the tension member, the foils being adapted to generate lift in response to the flow of the medium relative to the foils and thereby to cause tension members to rotate about a common center of rotation substantially parallel to the tension members;

circular members attached to the tension members, which circular members are capable of rotating about the rotation center and maintaining the spacing of the tension members from the center of rotation, at least one of the circular members rotating freely; and

power takeoff means.

4,151,425

VOLTAGE SEQUENCING CIRCUIT FOR SEQUENCING VOLTAGES TO AN ELECTRICAL DEVICE

Maurus Cappa, Unionville, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1978, Ser. No. 868,247

Claims priority, application Canada, Mar. 3, 1977, 273926

Int. Cl.[2] H03K *17/60, 17/28*

U.S. Cl. 307—130 **5 Claims**

1. A voltage sequencing circuit for sequencing the application of voltage levels to an electrical device, said circuit comprising:

a first transistor switch connecting a first input terminal to a first output terminal,

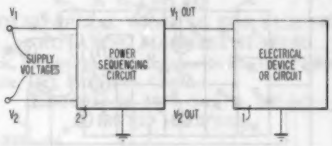
a first voltage source connected to said first input terminal,

a second transistor switch having an input electrode, an output electrode and a control electrode, said input electrode being connected to a control electrode of said first switch,

a delay circuit connected to the control electrode of said second switch, a second input terminal connected to the input of said delay circuit,

a second voltage source connected to said second input terminal,

a second output terminal connected to said second input



terminal, whereby said first switch is conductive only when said second switch is conductive and said delay circuit prevents said second switch from conducting until a predetermined voltage from said second voltage source has been maintained at said second input terminal for a preselected time interval.

4,151,426

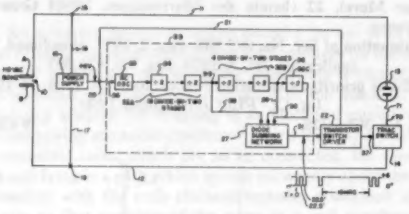
SECURITY TIMER DEVICE

Edward G. Price, Salt Lake City, Utah, assignor to Beehive International, Salt Lake City, Utah

Filed Jul. 14, 1977, Ser. No. 815,528

Int. Cl.[2] H03K *5/13*

U.S. Cl. 307—141 **9 Claims**



1. A timer device including, in combination, an alternating current input, an alternating current output, oscillator means coupled to said input for generating an output series of pulses, frequency divider network means coupled to said oscillator means and responsive to said output series of pulses for producing separated, plural pulse trains of mutually differing periodicity, summing network means coupled to said frequency divider network means and responsive to said plural pulse trains for producing a signal comprising spaced trains of pulses, and separate means interposed between said alternating current input and said alternating current output, coupled to said summing network means, and responsive to said signal thereof for automatically intermittently connecting the voltage of said alternating current input to said alternating current output in correlation with pulse presence in said signal.

4,151,427

HIGH-VOLTAGE ZERO-CROSSING DETECTOR

Lev V. Travin, Krasnokazormennaya ulitsa, 12, korpus 3, kv. 44, Moscow, U.S.S.R.

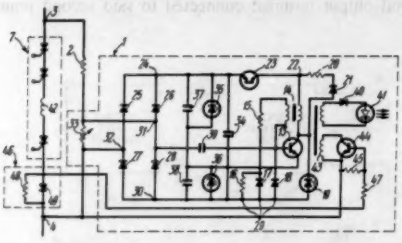
Filed Jul. 15, 1977, Ser. No. 816,031

Int. Cl.[2] H03K *17/72, 5/153*

U.S. Cl. 307—252 UA **2 Claims**

1. A high-voltage zero-crossing detector comprising: a voltage divider; a rectifier connected to an output of said voltage divider; a stabilitron limiter having two stabilitrons connected in series, a blocking generator having a transistor and a transformer; the base of said transistor being connected to an input of said rectifier; there being connected in parallel across the

outputs of said rectifier an energy storage capacitor and a series circuit made up of two capacitors; each of said capacitors being shunted by one of said stabilitrons of said stabilitron



limiter; the common point of said stabilitrons being connected to the emitter of said transistor of said blocking generator; the collector of said transistor being connected to said transformer which is connected via a dinistor to an output of said rectifier.

4,151,428

COATING OBJECTS BY ELECTROSTATIC SPRAYING

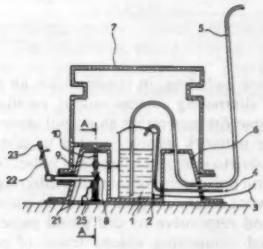
Roger Morel, 22 chemin des Marronniers, 38043 Grenoble, France

Continuation of Ser. No. 802,888, Jun. 2, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,597

Claims priority, application France, Jun. 23, 1976, 76 19660

Int. Cl.[2] F16P *1/00;* **B05B** *5/00*

U.S. Cl. 307—328 **9 Claims**



1. In an electrostatic coating apparatus for coating objects with an electrically conductive product, of the type in which a container for the conductive product is disposed in an electrically insulating chamber having a removable cover, said container being normally maintained at a relatively high voltage; the improvement comprising, an electrical ground, means for locking the cover in position on the container, means for electrically connecting the container to the electrical ground, operating means for controlling said means for locking the cover and said means for electrically connecting the container to ground so that said locking means does not release said cover for removal until said means for electrically connecting electrically connects said container to the electrical ground, said means for locking including means requiring relocking the cover on said container before said means for electrically connecting can disconnect the container from the electrical ground whereby the cover is locked on said container whenever the container is ungrounded.

4,151,429

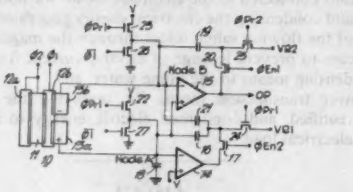
DIFFERENTIAL CHARGE SENSING CIRCUIT FOR MOS DEVICES

Gerard J. Hupe', Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1977, Ser. No. 838,892

Int. Cl.[2] H03K *5/20, 5/159;* **G11C** *19/28, 19/18*

U.S. Cl. 307—355 **10 Claims**



1. A circuit for sensing the difference in charge between a first output electrode and a second output electrode of an MOS device, said circuit comprising:

an inverting amplifier, including a feedback capacitor, responsive to the charge on said first output electrode of said MOS device;

a summing amplifier, including a feedback capacitor, responsive both to the charge appearing on said second output electrode of said MOS device and to the output signal from said inverting amplifier, via an interconnection capacitor;

means for precharging said first electrode and said second electrode to a first predetermined DC voltage level;

means for precharging the feedback capacitor of said inverting amplifier and the interconnection capacitor between the two amplifiers to a second predetermined DC voltage level;

means for precharging the feedback capacitor of said summing amplifier to a third predetermined DC voltage level;

means for selectively switching said feedback capacitors of the two amplifiers into, and out of, their respective feedback circuits; and

means for selectively grounding said first output electrode and said second output electrode.

4,151,430

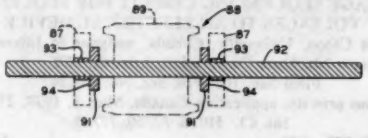
DYNAMOELECTRIC MACHINE STRUCTURES

William H. Stark, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 554,454, Mar. 3, 1975, Pat. No. 3,990,191. This application Oct. 18, 1976, Ser. No. 733,415

Int. Cl.[2] H02K *15/14;* **F16C** *1/00*

U.S. Cl. 310—90 **14 Claims**



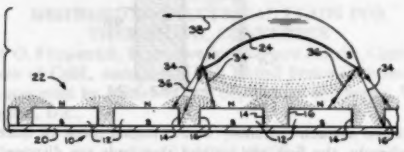
1. A dynamoelectric machine including a stator, a pair of bearing units, a shaft supported by the bearing units and having two ends; a rotor body having first and second ends secured to a portion of the shaft between the ends of the shaft; and a pair of accessory members positioned on the shaft and each extending axially toward one end of the shaft from axial locations along the shaft at least substantially proximate to the first end of the rotor body, to other axial locations along the shaft; said accessory members each having a surface region at the end thereof nearest a respective end of the shaft disposed generally

adjacent to a plane that is normal to the axis of the shaft and in proximity to an end face of the respective bearing unit supporting the shaft; said shaft being in a substantially permanently stressed condition at least along the surface regions thereof that extend from an axial position at least substantially proximate to the ends of the rotor body to the other axial locations.

4,151,431
PERMANENT MAGNET MOTOR

Howard R. Johnson, 3300 Mt. Hope Rd., Grass Lake, Mich. 49240

Filed Dec. 6, 1973, Ser. No. 422,306
Int. Cl.² H02K *41/00*; H02N *11/00*
U.S. Cl. 310—12 **28 Claims**

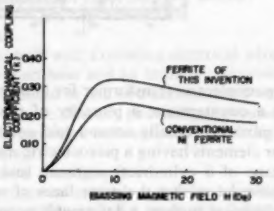


1. A permanent magnet motor comprising, in combination, a stator track defining a track direction and having first and second sides and composed of a plurality of track permanent magnets each having first and second poles of opposite polarity, said magnets being disposed in side-by-side relationship having a spacing between adjacent magnets and like poles defining said track sides, an elongated armature permanent magnet located on one of said track sides for relative movement thereto and in spaced relationship to said track side wherein an air gap exists between said armature magnet and said track magnets, said armature magnet having first and second poles of opposite polarity located at the opposite ends of said armature magnet defining the length thereof, the length of said armature magnet being disposed in a direction in general alignment with the direction of said track, the spacing of said armature magnet poles from said track associated side and the length of said armature magnet as related to the width and spacing of said track magnets in the direction of said track being such as to impose a continuous force on said armature magnet in said general direction of said track.

4,151,432
PRODUCTION OF FERRITES FOR MAGNETOSTRICTIVE VIBRATORS

Yumi Akimoto; Tamotsu Ishii, both of Omiya; Motohiko Yoshizumi, Urawa, and Sadaaki Haghino, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 484,869, Jul. 1, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,732
Claims priority, application Japan, Jul. 3, 1973, 48-74415; Jul. 7, 1973, 48-76131; Feb. 4, 1974, 49-13760; Fed. Rep. of Germany, Jul. 2, 1974, 2431699; France, Jul. 3, 1974, 74 23132; United Kingdom, Jul. 3, 1974, 29452/74
Int. Cl.² H01F *7/02*
U.S. Cl. 310—26 **6 Claims**

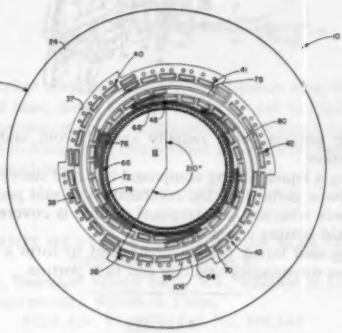


1. A supersonic magnetostrictive vibrator which comprises a magnetostrictive element of a macroscopically homogeneous sintered ferrite structure having an O/Fe atomic ratio of $4.0/3 < O/Fe < 4.1/3$, a resonance frequency f(KHz) of from 15 to 100 KHz, a density which is at least 90% of the theoretical density and an average grain size of from 0.7 to 50μ and a positive static magnetostriction.

4,151,433
COOLED SPIRAL WINDING FOR ELECTRICAL ROTATING MACHINE STATOR

Carl Flick, Pittsburgh, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 26, 1977, Ser. No. 800,640
Int. Cl.² H02K *9/00*
U.S. Cl. 310—54 **11 Claims**



1. An armature having an airgap winding for use in an electrical rotating machine operating at high voltages on the order of 30 kV and above, the armature comprising a plurality of coils mounted about the axis of rotation of the machine, said coils being adapted for coupling in an electrical circuit, each coil comprising electrical conductor means forming a plurality of concentric turns which are series connected, the turns in each coil lying in a path which spirals outwardly about the axis of rotation with the coils circumferentially positioned about the axis so that portions of the turns in a coil interleave in overlapping relationship with portions of the turns of an adjacent coil, with adjacent coils being radially spaced apart to define outwardly spiralling, continuous inter-coil spacing for the placement of insulation, said electrical conductor means for each said coil including a plurality of elongate parallel conductors, conduit means mounted in heat-exchange relationship along the conductors, an electrical insulating sheath enclosing the conductors and conduit means along the length of each said coil, and means for directing coolant medium through said conduit means.

4,151,434
CASTING ASSEMBLY FOR STATOR COILS AND METHOD

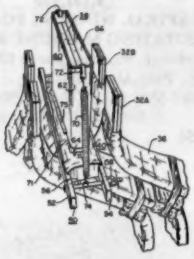
Michael R. Zona, McKeesport; Charles R. Ruffing, Edgewood, and Paul S. Johrde, Franklin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 683,117, May 4, 1976, Pat. No. 4,047,867. This application Apr. 7, 1977, Ser. No. 785,383
Int. Cl.² H02K *3/00*; B29C *6/00*
U.S. Cl. 310—71 **6 Claims**

1. A method of encapsulating a terminal portion of a coil end turn conductor which projects from the core of a dynamoelectric machine, said method comprising:

securing a pad to said terminal portion, said pad having radially extending side portions which circumscribe and extend transversely to said terminal portion to provide a barrier to the axial flow of a fluid relative to said terminal portion;

disposing a sleeve around said terminal portion in a spaced relation therewith, said sleeve having a continuous, circumferentially extending side portion bounded by said first and second open end portions, said sleeve providing a barrier to the radial flow of a fluid relative to said terminal portion, said first open end portion of said sleeve being disposed in abutting engagement with said pad, and said



side portion being radially spaced from said terminal portion;

casting a liquid potting compound into said sleeve to fill the volume defined by the combination of said pad and said sleeve whereby said terminal portion is covered by said liquid potting compound; and,

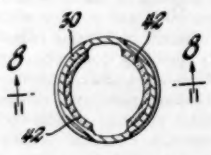
curing said liquid potting compound to form a hardened mass surrounding said coil end turn portion.

4,151,435

STATOR STRUCTURE USING FORMING CURVED WAFER THIN MAGNETS FROM RARE EARTH-COBALT ALLOY POWDERS

William F. Jandeska, Farmington Hills; Charles F. Netherton, Marine City, and Charles W. Vigor, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 779,525, Mar. 21, 1977, Pat. No. 4,104,787.
This application May 5, 1978, Ser. No. 903,156
Int. Cl.[2] H02K *21/26*
U.S. Cl. 310—154 **4 Claims**



1. A generally cylindrical motor casing having thin, curved rare earth-transition metal pole magnet pieces integrally bonded thereto, said casing being particularly suited for use in relatively compact high torque D.C. motors comprising a generally tubular metal sheet and at least two opposing rare earth-transition metal magnets each being on the order of about one millimeter thick, said magnets being densified and metallurgically bonded to the inner surface of the sheet by hot isostatic compaction.

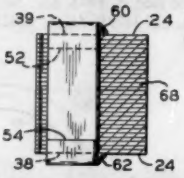
4,151,436

ELECTRICAL INSULATOR FOR SLOTTED MAGNETIC CORES

Chester A. Smith, Zeeland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 11, 1977, Ser. No. 795,738
Int. Cl.[2] H02K *3/36*
U.S. Cl. 310—215 **6 Claims**

1. A stator assembly comprising a magnetic core having an axially extending bore, a plurality of axially extending slots each communicating with the bore at an opening opposite a top surface of the slot, and at least one slot liner positioned within at least one of the slots of the core, coils having axially extending conductor portions disposed within the at least one slot and insulated from a wall of the slot by the slot liner, wherein, the slot liner comprises a piece of insulating material having first and second raw ends, a central portion and opposite end portions each connected to the central portion, with the opposite end portions of said piece folded in opposite directions relative to each other and relative to the central portion whereby sections of double thickness material are



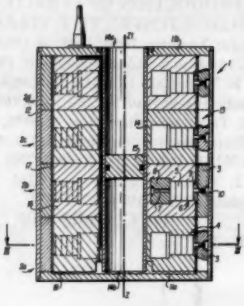
established at each extremity of the folded piece of material and whereby the first and second raw ends are disposed on opposite sides of the piece; the slot liner is positioned within the slot with the first raw end of the piece of insulating material being disposed adjacent the wall of the slot and with the second raw end being separated from the wall of the slot by at least the central portion of the slot liner; and the conductor portions of the coils are positioned within the slot and insulated from the wall of the slot by the slot liner with the conductor portions positioned adjacent the second raw end of the slot liner and separated from the first raw end by at least the central portion of the slot liner.

4,151,437

PIEZOELECTRIC TRANSDUCERS AND ACOUSTIC ANTENNAS WHICH CAN BE IMMERSED TO A GREAT DEPTH

Bernard Tocquet, Sanary, France, assignor to Etat Francais represente par le Delegue General Pour l'Armement, Paris, France

Filed Jul. 25, 1977, Ser. No. 818,960
Claims priority, application France, Aug. 3, 1976, 76 23652
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—337 **8 Claims**



1. In a piezoelectric transformer for immersion in a medium including a countermass; a plurality of piezoelectric motor elements mounted radially around said countermass, each of said motor elements having a piezoelectric member and a horn in the shape of a cylindrical segment, said motor elements being positioned so that the outer faces of said horns form a closed cylindrical surface; a deformable acoustically transparent cylindrical diaphragm surrounding the outer cylindrical faces of said horns; and first and second end covers covering

the ends of said cylindrical diaphragm, the improvement comprising:

a solid material having a plurality of cylindrical wells therein interposed between said horns and separated from said horns by a clearance space, and

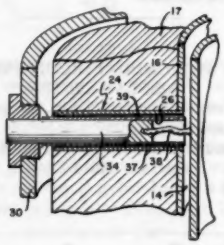
a plurality of pistons each located in a respective one of said cylindrical wells, each of said pistons separating the well within which it is located into a first portion communicating through an opening in said first cover with the medium outside of said envelope and a second portion communicating with the clearance space between said solid material and said horns, said clearance space and the second portions of said cylindrical wells being filled with a gas.

4,151,438

DISTRIBUTED ELECTRICAL LEADS FOR THERMIONIC CONVERTER

Gary O. Fitzpatrick, Livermore, and Edward J. Britt, Cupertino, both of Calif., assignors to The United States of America as represented by United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1977, Ser. No. 825,518
Int. Cl.[2] H01J *45/00*
U.S. Cl. 310—306 **6 Claims**



1. In a thermionic converter, the improvement for making an electrical connection with one of the electrodes thereof, comprising:

A one piece large area electrode, a one piece large area emitter electrode, a main bus bar positioned so that one of said electrodes is between said bus bar and the other of said electrodes, a plurality of distributed leads coupled to said bus bar at spaced apart locations and each lead penetrating through said one electrode at spaced apart locations and being coupled to said other electrode at spaced apart locations, each of said leads including a thick section extending from said bus bar and a flat flexible thin section coupled between said thick section and said other electrode.

4,151,439

VEHICLE LIGHT BULB WITH EXTENDING ELECTRICAL WIRES

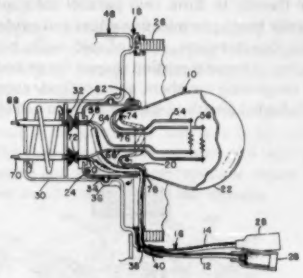
Richard L. Moss, 4321 S. 368th, Auburn, Wash. 98002

Filed Dec. 30, 1977, Ser. No. 866,027
Int. Cl.[2] H01J *5/54*
U.S. Cl. 313—318 **6 Claims**

1. Vehicle light bulb with extending electrical wires utilizing a conventional round base and an initially conventional glass envelope, to be installed in lieu of a conventional vehicle light bulb in a towing vehicle, thereby providing the connections for circuits lighting a respective conventional vehicle light bulb on a trailer, comprising:

(a) a conventional round base;

(b) an initially conventional glass envelope having conventionally centered filaments for respective lights and modified by having on its exterior, a depression groove of the glass envelope, and fitted concentrically into the round base with the depression groove located throughout the depth of the round base and extending above the round base to form an entry; and



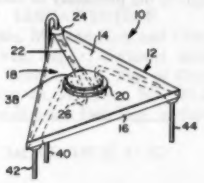
(c) electrical wires extending from a distance away from the round base, down through the entry and beyond within the depression groove and joined to respective light filaments to form respective positive and negative contacts of the round base.

4,151,440

CATHODE HEATER ASSEMBLY FOR ELECTRON DISCHARGE DEVICE

William E. Buescher, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 17, 1978, Ser. No. 896,644
Int. Cl.[2] H01J *1/24*
U.S. Cl. 313—340 **6 Claims**



1. A fast warm-up heater-cathode assembly for an electron discharge device comprising: a substrate of substantially pure, hexagonal crystal α alumina having opposed surfaces; a first metallized layer substantially centrally located on one of said surfaces; and a second metallized layer on an opposite surface, said second layer being at least partially serpentine configuration with said serpentine configuration being aligned with said first layer.

4,151,441

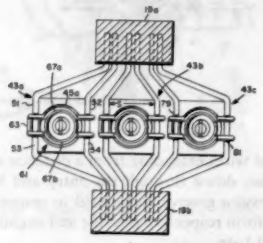
CATHODE SUPPORT MEANS IN ELECTRON GUN STRUCTURE OF A CATHODE RAY TUBE

Peter G. Puhak, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 11, 1978, Ser. No. 905,064
Int. Cl.[2] H01J *29/04, 29/50, 29/82*
U.S. Cl. 313—446 **7 Claims**

1. In a cathode ray tube electron gun structure integrated by a plurality of elongated rod-like members longitudinally arranged to support a plurality of spatially related electrode elements forming said structure wherein a thermionic cathode, having a closed forward end with electron emissive material disposed thereon, is positioned adjacent an apertured control electrode element, means for supporting said cathode comprising: a cathode positioning member including a substantially planar base section having a substantially central opening

formed therein of a size larger than the cross-sectional dimension of said cathode, said planar section having two parallel transverse bends therein one on either side thereof wherefrom opposed side members project in a manner substantially perpendicular thereto to form two parallel substantially similar skirt like walls having terminative edges and evidencing a span relationship therebetween, each of said walls having at least one extending extremital portion shaped for embedment in said elongated integrating members; and a cathode support member formed of a folded length of wire to provide a dual-leg clip-like



component having a closed end, an open end and a pair of substantially parallel intermediate portions wherebetween the rearward portion of said cathode is affixed in a manner substantially normal thereto, said component and cathode being located on and attached to the terminative edge regions of said perpendicularly related side members of said cathode positioning member to effect cathode orientation with the forward end thereof being spatially accommodated within the central opening of said cathode positioning member in a manner to protrude therethrough to the proximity of said control electrode.

4,151,442

COLOR TELEVISION CATHODE RAY TUBE

Yoshio Koga; Tsuneyo Sumita; Nobuo Inoue, and Susumu Matsuura, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 28, 1977, Ser. No. 810,784

Claims priority, application Japan, Jun. 29, 1976, 51-76011

Int. Cl.[2] C09K *11/18, 11/46;* **H01J** *29/20*

U.S. Cl. 313—467 **3 Claims**

1. A color television cathode ray tube which comprises a phosphor screen formed of

(A) a red-emitting phosphor selected from the group consisting of europium-activated rare earth metal oxide and europium-activated rare earth metal oxysulfide;

(B) a green-emitting phosphor selected from the group consisting of a mixture of copper-activated aluminum-coactivated zinc sulfide and gold-activated aluminum-coactivated zinc sulfide, and copper- and gold-activated aluminum-coactivated zinc sulfide; and

(C) a blue-emitting phosphor of silver-activated zinc sulfide, and

wherein the content of copper and the content of gold in the green-emitting phosphor are 0.005 to 0.02% by weight and 0.005 to % by weight, respectively, based on the total amount of the green-emitting phosphor.

4,151,443

LUMINESCENT MATERIALS AND DISCHARGE LAMP CONTAINING THE SAME

Petrus F. J. van den Boom, and Antonius M. J. H. Seuter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,398

Claims priority, application Netherlands, Oct. 3, 1977, 7710776

Int. Cl.[2] C09K *11/46*

U.S. Cl. 313—486 **3 Claims**

1. A luminescent material having the eulytine crystal structure, characterized in that the luminescent material has a composition defined by the formula $Ca_{3-x-y-p}Me_xSn_pLn_{1+y-q-r}A_qSb_r(PO_4)_{3-r}(SiO_4)_r$, wherein Me represents Sr and/or Ba, Ln at least one of the elements Y, La, Gd and Lu, and A represents Ce and/or Tb, wherein

$0 \leqq x \leqq 2.5$

$0 \leqq y \leqq 0.5$

$0 \leqq p \leqq 0.2$

$x+y+p \leqq 2.5$

$0 \leqq q \leqq 1+y-r$

$0 \leqq r \leqq 0.5$

$p+q+r \neq 0$

and wherein Sn when present being in the divalent state; Sb when present being in the trivalent state, and Ce when present being in the trivalent state.

4,151,444

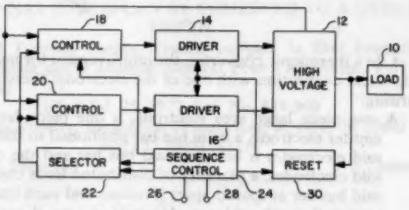
VOLTAGE SWITCHING CIRCUIT FOR A COLOR DISPLAY SYSTEM

Timothy A. Jenness, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 23, 1977, Ser. No. 863,974

Int. Cl.[2] H01J *29/80*

U.S. Cl. 315—1 **3 Claims**



1. Voltage switching display system, comprising:

a color display device of the type wherein the color of light emitted by a phosphor screen is changed in accordance with an electron accelerating voltage applied thereto;

a digitally controlled power supply for providing said accelerating voltage, said supply including means for switching and accelerating voltage between different levels; and

means operatively disposed between said display device and said power supply for causing said accelerating voltage to be re-utilized by said power supply on descending voltage levels.

4,151,445

INSTANT LIGHT LAMP CONTROL CIRCUIT

John M. Davenport, Lyndhurst, Ohio, and Michael N. Diamond, Grandview, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1978, Ser. No. 878,054

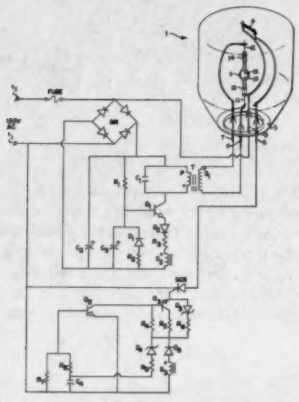
Int. Cl.[2] H05B *41/24, 41/46*

U.S. Cl. 315—92 **8 Claims**

1. In combination, an instant-light lamp comprising a high pressure miniature metal vapor arc tube and an incandescible filament mounted within a sealed vitreous envelope,

ballasting means having input terminals and comprising a source of electrical energy having a frequency between 20 and 50 kilohertz, transforming means in said source including an output circuit across which the arc tube is connected, said ballasting means including means for limiting the current flow in said output circuit,

and a filament control circuit comprising electronic switching means interposed between said terminals and said filament, and means for gating on said switching means comprising voltage sensing means in said transforming means having an output proportional to the voltage across the arc tube, and a voltage comparator circuit providing an output for gating on said switching means when the sensing means voltage is either below a predetermined low level or above a predetermined high level.



4,151,446

ELECTRONIC FLASH APPARATUS

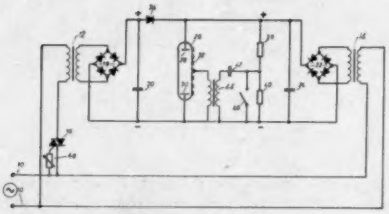
Wolfgang H. E. Ludloff, Mainstrasse 50, Cologne, Fed. Rep. of Germany

Filed Feb. 17, 1976, Ser. No. 658,345

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1975, 2508008

Int. Cl.[2] H05B *41/32*; H01J *61/80*

U.S. Cl. 315—241 R **12 Claims**



1. In an electronic flash apparatus of the type which includes:

a closed flash tube having main electrodes with a discharge distance therebetween, a cross-sectional area, and trigger electrode means for receiving a triggering pulse;

trigger circuit means for supplying a trigger impulse to the trigger electrode means;

storage capacitor means for receiving and discharging an electrical charge and connected across the main electrodes of said flash tube;

auxiliary capacitor means having small capacitance as compared to the capacitance of said storage capacitor means and connected across the main electrodes of said flash tube for receiving and discharging an electrical charge;

first charging circuit means for charging said storage capacitor means through at least one diode to a first charging voltage; and

second charging circuit means for charging said auxiliary capacitor means to a second charging voltage greater than the first charging voltage of said storage capacitor means,

the improvement comprising:

a quantity of inert gas contained within the closed flash tube, the pressure of the gas in said flash tube being substantially greater than the atmospheric pressure and said flash tube, said pressure and said storage capacitor means being dimensioned in accordance with the formula

$$\frac{(U)\sqrt{(g)}}{(L)(p)} \leqq 0.1$$

where "U" is the storage capacitor voltage in volts, "g" is the cross-sectional area of the flash tube in square millimeters, "L" is the discharge distance of the flash tube in centimeters, and "p" is the gas pressure in millimeters of mercury.

4,151,447

LINEAR MOTOR

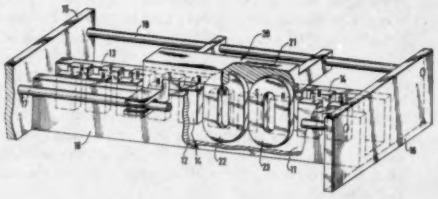
Johann von der Heide, Mönchweiler, and Georg F. Papst, St. Georgen, both of Fed. Rep. of Germany, assignors to Papst-Motoren, KG, St. Georgen, Fed. Rep. of Germany

Filed Nov. 28, 1977, Ser. No. 855,282

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1976, 2654075

Int. Cl.[2] H02K *41/02*

U.S. Cl. 318—135 **20 Claims**

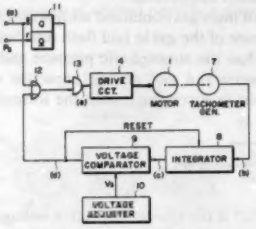


1. In a linear motor, in combination, a ferromagnetic structure including a pair of spaced parallel ferromagnetic bars; a row of magnets extending in the direction of the elongation of the bars and located at the inner side of one of the bars, the individual magnets of the row being magnetized in a direction transverse to the elongation of the bars, the successive magnets of the row being of alternate polarity; an armature and means mounting the armature for travel along the length of the two bars, the armature including a plurality of coils spaced one from the next in the direction of elongation of the bars and oriented to cut through the magnetic field lines of the magnets of the row of magnets in the space intermediate the two bars; and energizing means for energizing the armature coils periodically and in a cyclical sequence causing the armature to travel along the length of the two bars.

4,151,448
PULSE MOTOR DRIVING SYSTEM

Nobuhiro Azuma, Tokorozawa, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Aug. 22, 1977, Ser. No. 826,713
Claims priority, application Japan, Aug. 24, 1976, 51/100892
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 2 Claims



1. A system for driving a pulse motor, comprising:

drive pulse generating means responsive to input pulses for generating an output pulse in response to each input pulse applied thereto, and for applying the drive pulses in use to a pulse motor having a shaft for rotating the pulse motor shaft in a stepwise manner in response to successive driving pulses;

a tachometer for developing an output voltage proportional to speed of rotation and connected in use to the pulse motor shaft to develop an output voltage proportional to the speed of rotation of the pulse motor shaft;

a resettable integrator circuit connected to receive and integrate the output voltage of said tachometer and to develop an output voltage equal to the time integral of the output voltage of said tachometer, and said resettable integrator circuit developing in use an output voltage representative of the angle of rotation of the pulse motor shaft;

reference voltage generating means for generating a predetermined DC reference voltage;

a voltage comparator connected to receive the output voltage of said resettable integrator circuit and connected to receive the DC reference voltage for generating an output pulse each time the output of said integrator circuit equals said DC reference voltage;

means defining a circuit path for applying the output pulse from said voltage comparator circuit to said resettable integrator circuit for resetting said integrator circuit each time the output voltage of said integrator equals said DC reference voltage; and

control means connected to said voltage comparator and said drive pulse generating means for applying output pulses from said voltage comparator to said drive pulse generating means for enabling said drive pulse generating means to develop a drive pulse for driving the pulse motor each time the output of said integrator circuit equals said DC reference voltage.

4,151,449
POSITIONING CONTROL APPARATUS

Shuichi Takahashi, 1-1-16, Takaidohigashi, Suginamiku, Tokyo, Japan

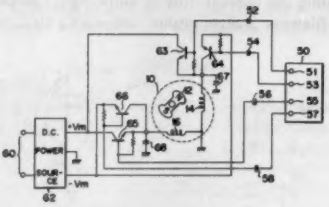
Filed Jan. 30, 1978, Ser. No. 873,435
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—138 4 Claims

1. A positioning control apparatus comprising:

a polyphase synchronous motor;

a register means for storing an angle data code representing a reference electrical position angle ϕ for the rotor of said motor;

a data processing means connected to the output of said register means for receiving the contents of said register means and generating cosine data codes respectively representing $\cos\phi$, $\cos(\phi-2\pi/N)$, ... $\cos\{\phi-(k-1)2\pi/N\}$, ... $\cos\{\phi-(N-1)2\pi/N\}$ where N being the total number of phases of said polyphase synchronous motor, and k being the sequential order of a phase concerned; and

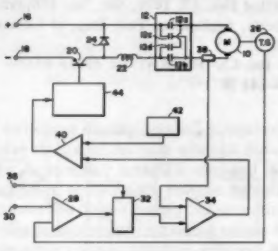


each one controllable power supply for each phase winding of the polyphase stator windings of said motor, said controllable power supply receiving the cosine data code for the phase concerned from said data processing means and controlling the current in said phase winding to maintain said current at a value proportional to said cosine data represented by said received cosine data code.

4,151,450
PROTECTIVE MEANS FOR FEEDER OF MACHINERY WITH DC-MOTOR

Nobuo Fukuma, Toyota; Yoshito Kato, Aichi, and Kouji Nogami, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 28, 1977, Ser. No. 819,814
Claims priority, application Japan, Sep. 22, 1976, 51-127719[U]
Int. Cl.[2] H02K *17/32*
U.S. Cl. 318—317 4 Claims



1. A protective means for a feeder of machinery with a DC-motor to drive a work-table comprising a detecting means for sensing revolution speed of a main shaft of said DC-motor, a comparator means for transmitting control signals based upon difference measured by comparing the revolution speed thus sensed to a predetermined speed value, a control means for limiting said control signals to a predetermined value in case such control signals are beyond said predetermined value, said control means comprising a means respectively for setting up a first value or a second value as its predetermined value and said first value corresponds to a maximum allowable value of an armature current and said second value corresponds to a value smaller than said maximum allowable armature current, and an armature current control means for adjusting current to an armature of the DC-motor according to said control signals.

4,151,451
GRAPHIC INPUT CONTROLLED AUTOMATIC POSITIONING SYSTEM

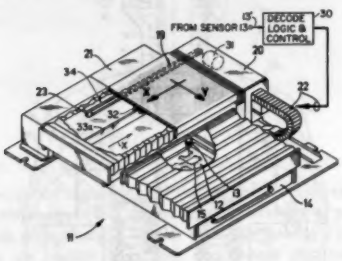
Horst Maertins, Berlin; Peter Rothfuss, Ditzingen; Gernot Maier, Stuttgart, and Ulrich Stratemeier, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 13, 1977, Ser. No. 759,131

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601638

Int. Cl.[2] G05B *19/42*

U.S. Cl. 318—568 **16 Claims**



1. Controlled automatic positioning system to locate a device in a particular position in space, in accordance with a recorded program, and signals derived from said program, comprising

a two dimensional program carrier (**12**) having a program recorded thereon in form of optically recognizable separate symbols representative of

(a) a commanded path of the device between immediately succeeding commands and illustrated by connecting lines between adjacent symbols, and

(b) commanded operating conditions including presence or absence of movement, or change of movement of said device,

a movable support (**11**) movable in two directions in accordance with a Cartesian system;

drive power means (**20, 21**) coupled to the support to move the support in said directions;

sensing means (**13**) comprising at least four sensing elements (**18**) located in quadrants with respect to the Cartesian coordinate system, positioned in sensing relation to said program carrier and sensing the respective separate symbols, said sensing means moving in synchronism with movement of said movable support (**11**) as commanded by the signals derived from the program, the program being an analog of the movement to be carried out by said support (**11**) as driven by said drive power means (**20, 21**);

said symbols representative of commanded operating conditions being additonal to the symbols representative of said commanded path of the device and positioned in quadrants with respect to said Cartesian coordinate system other than the symbols representative of said commanded path;

and decode logic and control means (**30**) connected to receive signals from the respective sensing elements (**18**) representative of sensed information at the respective quadrants derived from said program, decoding said information with respect to commands represented by respectively sensed signals, and controlling said drive power means (**20, 21**) to control movement and direction of the support in accordance with the program,

whereby, when the decode logic and control means receives signals from two sensing elements only, data are being presented thereto indicative of direction of movement, while, if the decode logic and control means receives signals from more than two sensing elements, data are being presented thereto indicative or presence of an operating command due to the presence of signals from a quadrant additional to the signals from the connecting lines.

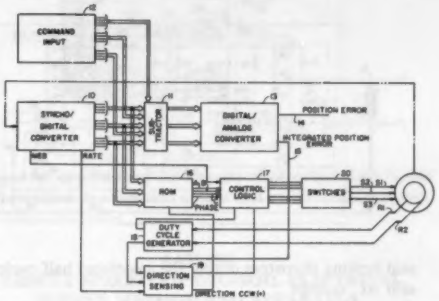
4,151,452
SYNCHRO DRIVE

William E. Yonescu, Ronkonkoma, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,199

Int. Cl.[2] G05B *19/30*

U.S. Cl. 318—605 **9 Claims**



1. A synchro drive system comprising a synchro unit having stator windings and an energized rotor, means for generating data indicative of the desired position of said synchro unit, comparison means for comparing the actual position of said synchro unit with said data, switching means for selectively interconnecting the stator windings of said synchro unit, said switching means being controlled by said comparison means to effect interconnections that drive said rotor in a direction to reduce the difference between said actual position and said data.

4,151,453
INDUCTION MOTOR CONTROL SYSTEM

Shigehiko Suzuki, and Satoshi Imaiida, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 21, 1978, Ser. No. 880,015

Claims priority, application Japan, Feb. 18, 1977, 52-16741

Int. Cl.[2] H02P *3/20*

U.S. Cl. 318—762 **6 Claims**

1. An induction motor control system comprising:

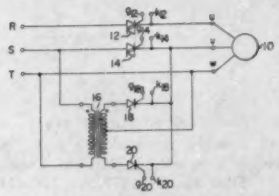
an AC voltage source for producing an AC voltage;

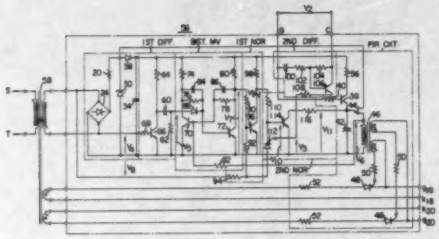
an induction motor;

a rectifier circuit means connected between said AC voltage source and said induction motor, including at least two unidirectional braking thyristors, each of said thyristors having associated therewith one half cycle of said AC voltage, for applying a DC voltage to said induction motor and controlling the DC braking torque produced by said induction motor;

a gate pulse generator circuit having a DC braking control signal applied thereto, connected to said rectifier circuit means and said AC voltage source, including a firing circuit connected to said braking thyristors for firing said braking thyristors, for firing a predetermined one of said braking thyristors during the next succeeding half cycle of said AC voltage associated with said predetermined one

of said braking thyristors following the application of said DC braking control signal and thereafter for firing each of





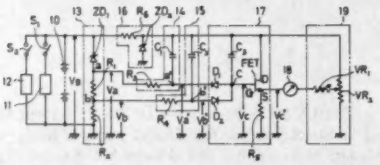
said braking thyristors during the associated half cycle of said AC voltage.

4,151,454

REMAININC CAPACITY DETECTOR OF A BATTERY

Toshiharu Iida, Nagoya, Japan, assignor to Kabushiki Kaisha Aichi Denkikosakusho, Aichi, Japan

Filed Sep. 12, 1977, Ser. No. 832,124
Claims priority, application Japan, Sep. 20, 1976, 51/112670
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—48 **2 Claims**



1. A remaining capacity detector, for a battery, comprising:

(i) a calibration circuit for charging and discharging, said calibration circuit being connected to the terminals of said battery and adapted to change the terminal voltage of the battery into an output corresponding to the remaining capacity of the battery under charge or discharge,

(ii) a memory circuit connected to said calibration circuit and adapted to memory the output of said calibration circuit,

(iii) integrating circuit means interposed between said calibration circuit and said memory circuit and adapted to integrate the output of said calibration circuit, said integrating circuit means consisting of an integrating circuit for discharge with a longer time constant, and of an integrating circuit for charge with a shorter time constant, and,

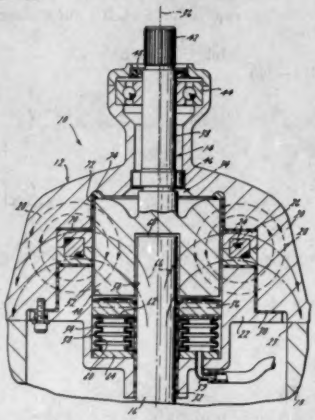
(iv) an indicator connected to the terminals of said memory circuit and adapted to show the remaining capacity of said battery.

4,151,455

DIVIDED HOUSING UNIPOLAR DYNAMOELECTRIC MACHINE

Adam M. Janotik, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1977, Ser. No. 863,101
Int. Cl.[2] H02P *9/00*
U.S. Cl. 322—48 **7 Claims**



1. A divided housing unipolar dynamoelectric machine with variable resistance control of machine current, said machine comprising:

a stator, said stator comprising first and second housing portions and a field coil, said first and second housing portions being electrically insulated from one another and together defining a chamber having an axis, each of said housing portions having an opening therein at locations on said axis, said field coil being annular in shape, concentric with said axis and positioned between said first and second housing portions, said housing portions being made from ferromagnetic and electrically conductive material;

a rotor journalled in said first housing portion for rotation about said axis, said rotor including a shaft extending from said chamber defined by said housing portions and through said opening in said first housing portion, said rotor having a portion within said chamber of diameter greater than the diameter of said shaft, said rotor portion being made from a ferromagnetic and electrically conductive material and having an axially extending recess, said rotor portion being spaced from said stator, thereby to form an annular space between them;

a control member made from a material having some electrical resistance, said control member extending from the exterior of said housing, through said opening in said second housing portion, and into said chamber and said recess in said rotor portion, said control member being electrically insulated from said second housing portion and spaced from said rotor portion, thereby, to form an annular space between said control member and said rotor portion;

said machine including a cavity in said chamber, said cavity being formed between said housing portion, said rotor portion and said control member, the annular spaces between said control member and said rotor portion and between said rotor portion and said stator communicating with said cavity;

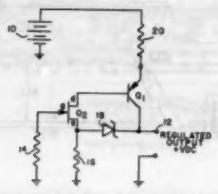
a liquid metal within said cavity; and

means for forcing said liquid metal out of said cavity and into said annular spaces, thereby, to provide electrical contact between said control member and said rotor portion and between said rotor portion and said stator.

4,151,456
VOLTAGE REGULATOR FOR BATTERY POWER SOURCE

James M. Black, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1978, Ser. No. 885,049
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—22 T 7 Claims



1. A circuit for regulating the output voltage delivered from a source with respect to a source of ground reference potential, said circuit comprising: a bipolar transistor having a collector electrode, an emitter electrode, and a base electrode, said collector electrode being connected to a voltage output terminal and said emitter electrode being connected to said voltage source; a zener diode; a first resistor; a second resistor; a field-effect transistor having a source electrode, a drain electrode and a gate electrode, said gate electrode being connected to said source of ground reference potential by said first resistor, one of said source and drain electrode being connected to said base electrode of said bipolar transistor, and the other of said source and drain electrodes being connected to both said source of reference potential by said second resistor and to said collector electrode of said bipolar transistor by said zener diode with a polarity to cause said diode to be reverse-biased in the circuit.

4,151,457
MICROWAVE METHOD AND APPARATUS FOR DETERMINATION OF ADSORBED FLUID IN SUBSURFACE FORMATIONS

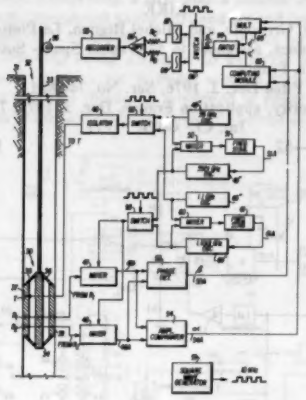
Rama N. Rau, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 674,792, Apr. 8, 1976, Pat. No. 4,077,003. This application Mar. 31, 1977, Ser. No. 783,093
The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.
Int. Cl.[2] G01V *3/18, 3/12*
U.S. Cl. 324—6 27 Claims

1. Apparatus for determining the amount of adsorbed fluid in formations surrounding a borehole, comprising:

means for deriving a first quantity which is a function of the loss tangent of said formations as measured by passing electromagnetic energy of a first frequency through said formations;

means for deriving a second quantity which is a function of the loss tangent of said formations as measured by passing electromagnetic energy of a second frequency through said formations; and

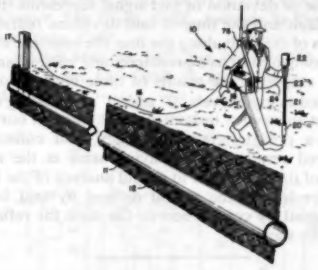


means for determining the amount of adsorbed fluid in said formations as a function of said first and second quantities.

4,151,458
CLOSELY SPACED PIPE-TO-SOIL ELECTRICAL SURVEY METHOD AND APPARATUS

William H. Seager, Edmonton, Canada, assignor to Harco Corporation, Medina, Ohio

Filed Jul. 29, 1977, Ser. No. 820,379
Int. Cl.[2] G01V *3/00;* G01R *31/02*
U.S. Cl. 324—9 24 Claims



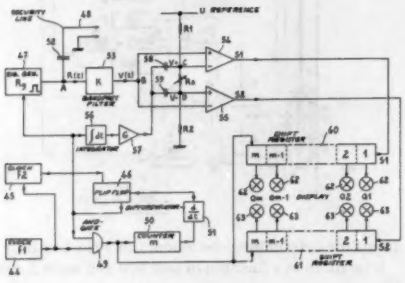
1. A readily portable apparatus for making relatively closely spaced electrical surveys of sub-surface structures adapted to be manually transported therealong by a single person walking along such structures comprising a portable support, manually held reference electrode means contactible with the surface proximate the structure, a supply of lightweight, small gage, disposable elongate electrically conductive magnet wire means for electrically and mechanically connecting the apparatus with the structure at a reference location thereon, storage means for storing said supply of said wire means on said portable support, meter means electrically connected between said electrode means and said wire means for indicating the potential difference between said reference electrode means and said wire means, and distance measuring means mounted on said portable support and driven by said wire means for measuring the length of said wire means as it is played out from the apparatus as the latter is manually transported along the surface above the structure whereby the structure-to-surface potential difference may be determined by such single person at measured distances along the length of the structure.

4,151,459

METHOD OF AND APPARATUS FOR THE LOCALIZING OF SECURITY LINE FAULTS FOR SKI LIFTS AND THE LIKE

Aimé Fayolle, Grenoble, and Michel Rignon, Le-Pont-de-Claix, both of France, assignors to Metraplan Spaa - Societe Anonyme, Isere, France

Filed Dec. 2, 1976, Ser. No. 746,881
Claims priority, application France, Dec. 3, 1975, 75 37694
Int. Cl.[2] G01R *31/11*
U.S. Cl. 324—52 **12 Claims**



1. A process for locating a fault along a security line for a cable railway which comprises the steps of:

applying to said security line a voltage pulse capable of generating a response in the form of an electrical echo signal from an end of the line;

detecting the response of the line in the form of an echo signal to the voltage pulse; and

comparing the detected response to the normal response of the same line in the absence of a fault, thereby producing a signal representing a sense of deviation from the normal response and a time of deviation of said signal, whereby the sense of deviation of said signal represents the nature of the fault and the time of said deviation represents the location of the fault along the line, the response of the line being compared to two predetermined values flanking the normal response, the results of these comparisons being expressed as logic levels "0" and "1", registering the logic levels at successive instants over an interval corresponding to a predetermined frequency, and collecting the registered results and displaying same at the end of a period of time sufficient to permit analysis of the line over its entire length, the period defined by said frequency being small by comparison to the time for reflection of said echo signal.

4,151,460

HIGH RESISTANCE GROUND FAULT DETECTOR AND LOCATOR FOR POLYPHASE ELECTRICAL SYSTEMS

Daniel R. Seese, North Versailles, and Alfred A. Regotti, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1977, Ser. No. 838,263
Int. Cl.[2] G01R *31/08*
U.S. Cl. 324—52 **9 Claims**

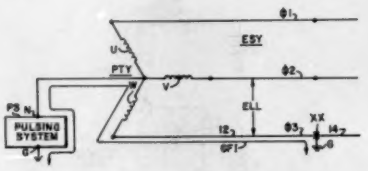
1. A ground fault detector for a three phase wye connected electrical power system, comprising:

(a) voltage sensitive relay coil means connected between the neutral of said power system and ground, said relay coil means being actuated by the voltage which results between said neutral and said ground as a result of the flow of ground fault current;

(b) control means electrically interconnected with the contacts of said relay coil means for alternately opening and closing another relay contact means at a predetermined frequency only when said relay coil means is actuated;

(c) first resistive means interconnected between said neutral and ground in the return path of said ground fault current for limiting said ground fault current to a predetermined value; and

(d) second resistive means interconnected in series circuit relationship with said another relay contact means, said series combination of said another relay contact means and said second resistive means being interconnected between said neutral and said ground in parallel circuit



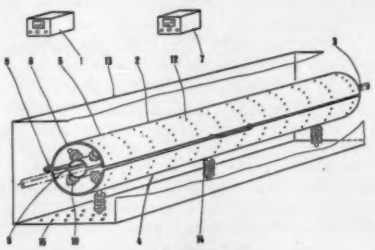
relationship with said first resistive means for changing the total resistance of said return path at said frequency for thus alternating the value of said ground fault current between said predetermined value and a higher value for thus providing alternating electromagnetic radiation in the vicinity of that part of said power system which carries said ground fault current for thus giving an indication of the location of said ground fault current.

4,151,461

TESTER OF DRY DIELECTRIC STRENGTH FOR INSULATED ELECTRIC CABLE

Gilbert Pontre, Montmorency, France, assignor to CEFILAC, Paris, France

Filed Jan. 16, 1978, Ser. No. 869,583
Claims priority, application France, Jan. 21, 1977, 77 02673
Int. Cl.[2] G01R *31/16*
U.S. Cl. 324—54 **4 Claims**



1. A tester of dry dielectric strength of the insulating sheath of a continuously traveling electric cable which comprises:

(a) a source of high alternating voltage applied between the grounded core of the cable and the external surface of the sheath,

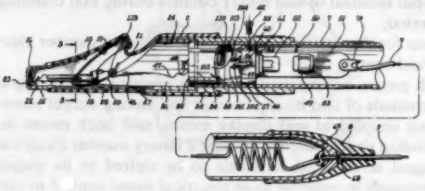
(b) means for measuring fault current in said cable, said means comprising a tube surrounding the cable and containing an ionized atmosphere for maintaining electrical contact with the sheath, and a generator which is independent of the measuring circuit supplying the voltage for ionization, said tube consisting of two cylindrical conducting walls, which are coaxial to the cable and electrically insulated from each other, between which the ionization voltage is applied, barbs secured to the outer wall of said conducting walls and extending radially inwardly passing through passages in said internal wall so as to allow the space between the cable and the internal wall to be ionized.

4,151,462

ELECTRICAL TEST PROBE HAVING A SPRING BIASED CLIP WITH AN EXTENDABLE AND RETRACTABLE TIP MOVABLE WITHIN THE CLIP

A. Lee Teyler, 319 Foster La., Billings, Mont. 59101

Filed Apr. 13, 1977, Ser. No. 787,043
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—72.5 19 Claims



1. An electrical probe for determining the presence and absence of an electrical signal at a predetermined potential source of electrical energy, said probe comprising:

a. a housing, said housing including a first sleeve and a second sleeve, said second sleeve being concentric with and slidably translatable with respect to said first sleeve;

b. an electrically conductive clip for gripping and contacting the electrical source, said clip having a pivotable element and a base element, which base element is secured to said first sleeve and including electrically conductive spring means for biasing the pivotable element of said clip toward said base element of said clip;

c. an extendible electrically conductive tip secured to said second sleeve for making a point contact with the electrical source, said tip being retractable within an envelope defined by the pivotable element and the base element and extendible from within the envelope;

d. an electrically conductive block and an electrically conducting ram extending from said block for supporting said tip, said block being affixed to said second sleeve and disposed intermediate said second sleeve and said tip for imparting the translational movement of said second sleeve with respect to said first sleeve to said tip and extend said tip from within the envelope;

e. an electrically conductive roller supported by said spring means for slidably bearing against a surface of said ram; and

f. first and second cam surfaces disposed upon the surface of said ram for alternately receiving said roller, said first cam surface being located to receive said roller when said tip is retracted and said second cam surface being located to receive said roller when said tip is extended; whereby, said roller secured to and supported by said spring means aids in maintaining said tip retracted and extended and aids in maintaining electrical and mechanical contact between said roller and said block;

g. electrical conductor means in electrical communication with said block for conveying an electrical signal present at the electrical source;

whereby, sliding movement of said second sleeve relative to said first sleeve results in commensurate extension and retraction of said tip out of and into said clip.

4,151,463

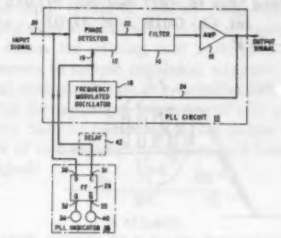
PHASE LOCKED LOOP INDICATOR

Lynden U. Kibler, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 2, 1978, Ser. No. 874,507
Int. Cl.[2] G01R *23/00*
U.S. Cl. 324—82 4 Claims

1. An indicator arrangement for a phase locked loop circuit, the loop circuit including a phase detector comprising a first and a second input terminal connected to an input terminal of the loop circuit and an output terminal of a frequency modulated oscillator disposed in the feedback path of the loop circuit, respectively, the indicator arrangement comprising:

a flip-flop comprising a first and a second input terminal directly connected to the first and second input terminals, respectively, of the phase detector and an output terminal, said flip-flop being arranged to generate a first output signal at said output terminal when a signal at the first input terminal thereof is advanced in phase to the input signal at the second input terminal thereof and to generate



a second output signal, complementary to said first output signal, at said output terminal when a signal at the first input terminal thereof lags in phase to the input signal at the second input terminal thereof; and

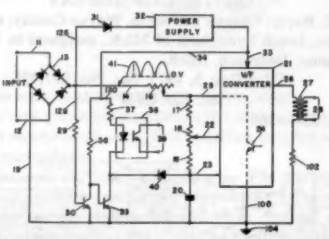
means, connected to the output terminal of said flip-flop, capable of indicating a locked and an unlocked condition in the phase locked loop circuit by the activation and deactivation, respectively, of said indicating means in response to the generation of said respective first and second output signals.

4,151,464

INTEGRATING VOLTAGE TO FREQUENCY CONVERTER AND MEMORY DECODER

Edward Cooper, San Diego, Calif., assignor to Power-Science, Inc., San Diego, Calif.

Filed Mar. 28, 1977, Ser. No. 781,570
Int. Cl.[2] G01R *19/16, 19/26*
U.S. Cl. 324—103 P 22 Claims



1. An integrating voltage to frequency converter and memory decoder for determining the occurrence of maximum or minimum voltages of input cyclic line voltages for selected time periods, comprising:

rectifier means for rectifying input cyclic line voltages to rectified half-waves,

voltage to frequency converter means for converting said half-waves to pulses, which pulses are proportional in number to the integrated voltage of said half-waves,

strobe means for providing a strobe pulse at zero voltage levels of said half-waves,

counter means responsive to said strobe pulses and said pulses for counting said pulses for each half-wave,

comparison memory means for making maximum or minimum comparisons of pulse counts in said counter means for successive half-waves and storing the maximum or

minimum counts occurring over a given number of half-waves,

and decoder means for decoding the maximum or minimum counts to maximum or minimum voltage levels.

4,151,465

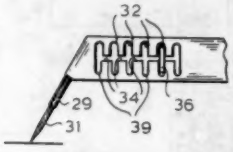
VARIABLE FLEXURE TEST PROBE FOR MICROELECTRONIC CIRCUITS

Seymour S. Lenz, P.O. Box 669, Longwood, Fla. 32750

Filed May 16, 1977, Ser. No. 797,073

Int. Cl.[2] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **14 Claims**



1. A test probe for electronic circuits and the like, comprising in combination:

a probe arm adapted for joinder to a support member adjacent to an electronic circuit to be tested, said probe arm having a flexible neck portion at one end thereof;

means for fastening said probe arm to said support member;

an electrically conductive tip attached to said neck portion and having and end adapted to contact a portion of said electronic circuit; and

means for varying the flexure of said neck, whereby the pressure of said tip relative to said circuit can be controlled, said neck having a void therein and insertion means for positioning in said void, whereby said neck has a first flexure characteristic without said insertion means in said void and a second flexure characteristic while said insertion is in said void.

4,151,466

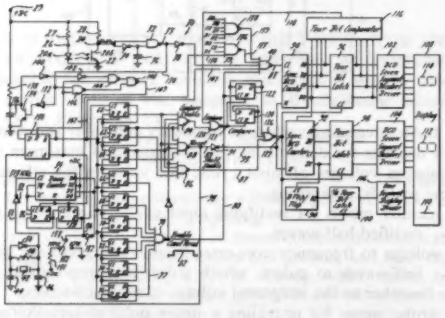
DIGITAL SPEEDOMETER WITH INDEX COUNTER CONTROL OF DISPLAY

Curtis E. Boyer, Canton Township, Wayne County, and Jacques Mosier, South Lyon, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1977, Ser. No. 857,496

Int. Cl.[2] G01P *3/54*

U.S. Cl. 324—166 **6 Claims**



1. A digital speedometer for indicating angular or linear velocity, which comprises:

means for generating a pulsating electrical signal having a pulse repetition frequency proportional to the angular or linear velocity to be indicated;

means for repetitively generating a counting period electrical signal having a predetermined duration representing a counting period;

a resettable binary counter having an input terminal and a plurality of output terminals, said binary counter being able to count electrical pulses occurring at its input terminal and being able to retain the count in the form of a binary number electrical signal at its output terminals;

means for gating said pulsating electrical signal into said input terminal of said binary counter during said counting period;

means for displaying the magnitude of binary number electrical signals;

latch means, having input terminals coupled to said output terminals of said binary counter and having output terminals coupled to said display means, said latch means including shift means for causing a binary number electrical signal at its input terminals to be shifted to its output terminals in response to an electrical signal applied to said shift means;

means for comparing, at the end of each counting period, the binary number electrical signal at the input terminals of said latch means with the binary number signal at its output terminals; and

index counter means, coupled to said comparing means and to said shift means of said latch means, for preventing the shift of a binary number electrical signal at said input terminals of said latch means to said output terminals of said latch means unless said comparing means indicates nonequality of said compared binary number electrical signals at the end of each of a plurality of said counting periods, the shift of said binary number electrical signal causing a change in magnitude displayed by said display means.

4,151,467

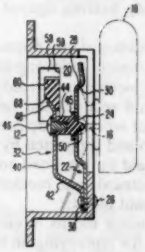
SWITCHED MICROPHONE HANG-UP BRACKET

Robert M. Kongelka, Washington, and Paul L. Buess, Pittsburgh, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,301

Int. Cl.[2] H04B *1/38;* **H04M** *11/00;* **H01H** *3/16*

U.S. Cl. 325—15 **5 Claims**



1. A microphone hang-up bracket for use with a microphone and related electronic system, the microphone including a switch normally biased to a first position and which can be placed in a second position, said switch enabling and disabling said system, said bracket comprising:

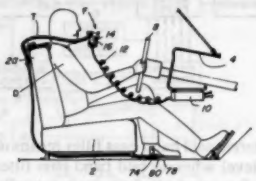
a body adapted to receive and releasably secure said microphone thereto, and means connected to said body capable of assuming two actuating positions, which when in one of these two actuating positions with said microphone secured to said body, engages said switch and places it in its second position, and when in the other of its two actuating positions, with said microphone secured to said body, does not engage said switch, whereby said switch assumes its first position.

4,151,468

MICROPHONE HOLDER ATTACHMENT AND SWITCH CONTROL THEREFOR

Leslie I. Kerr, 16 Polk Rd., Hingham, Mass. 02043

Filed Aug. 25, 1977, Ser. No. 827,473
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—15 7 Claims



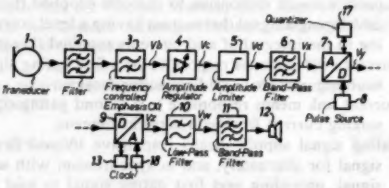
1. Apparatus for supporting a Citzens Band transceiver microphone together with an externally located control switch in a position to be operated by the driver of a motor vehicle, said apparatus including a microphone holder frame in which the microphone may be detachably secured to present the control switch in an exposed position at one side thereof, means for adjustably locating the holder frame and microphone in front of the vehicle driver in a speaking mode, switch actuating means slideably received in the frame in closely spaced relation to the control switch of the microphone and foot pedal means connected to the switching actuating means for moving the actuating means into and out of contact with the said control switch.

4,151,469

APPARATUS EQUIPPED WITH A TRANSMITTING AND RECEIVING STATION FOR GENERATING, CONVERTING AND TRANSMITTING SIGNALS

Peter Frutiger, Wangen, Switzerland, assignor to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 567,539, Apr. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 327,298, Jan. 29, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,707
Claims priority, application Switzerland, Feb. 1, 1972, 141572/72
Int. Cl.[2] H04B 1/64
U.S. Cl. 325—38 R 7 Claims



1. The apparatus comprising:

a transducer for converting an acoustical signal into an analogue electrical signal;

band-limiting filter means for filtering out those components of said analogue electrical signal which fall above and below a predetermined frequency band;

emphasizing circuit means for adjusting the amplitude of those frequency components of said band limited analogue electrical signal falling within said predetermined frequency band such that the power of each of said frequency components is substantially equal;

syllabic amplitude compressor means for regulating the amplitude of said adjusted, band-limited analogue electrical signal, said syllabic amplitude compressor means having forward and backward acting regulation time constants, said forward acting time constant being greater than its backward acting time constant whereby said syllabic amplitude compressor means amplifies positive going changes in amplitude of the signal applied to its input at a rate which is faster than the rate at which it amplifies negative going changes in the amplitude of the signal applied to its input;

analogue-to-digital converter means having a non-linear quantization characteristic with smaller quantizing steps at signal input levels of smaller magnitude and larger quantizing steps at signal input levels of higher magnitude;

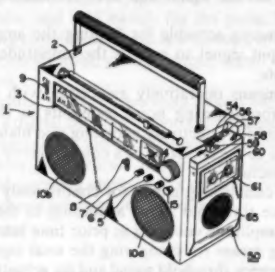
sampling means for causing said analogue-to-digital converter means to sample regulated, adjusted, band-limited electrical analogue signal at a sampling rate which is less than twice the maximum frequency of said predetermined frequency band to provide a digital output signal representative of said regulated, adjusted and bandlimited analogue signal.

4,151,470

COMBINED PORTABLE TAPE RECORDER AND STEREOPHONIC RECEIVER SYSTEM

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 596,172, Jul. 15, 1975, Pat. No. 4,046,973. This application Jun. 23, 1977, Ser. No. 809,167
Claims priority, application Japan, Jul. 18, 1974, 49-81663; Jul. 22, 1974, 49-83906; Nov. 9, 1974, 49-129184; Nov. 9, 1974, 49-129185; Nov. 14, 1974, 49-131284
Int. Cl.[2] H04B 1/20; G11B 31/00
U.S. Cl. 325—311 4 Claims



1. Portable stereophonic apparatus, comprising:

a portable tape recorder including a left channel and a right channel record head; and a first amplifier coupled in series with a microphone;

an FM stereophonic radio including an FM stereophonic tuner and a stereo multiplexer electrically connected to said tuner for generating left and right channel signals, said stereophonic radio also including a left channel amplifier in series with a left channel speaker and a right channel amplifier in series with a right channel speaker;

means for mechanically coupling and decoupling said portable tape recorder to said radio such that said tape recorder and radio may be decoupled to form two independent units or coupled to form a single integrated unit;

first and second electrical connector means associated with said stereophonic radio;

third and fourth electrical connector means associated with said portable tape recorder, said first and third electrical connector means adapted to be electrically connected and said second and fourth electrical connector means adapted to be electrically connected when said tape recorder and radio are mechanically coupled to form a single integrated unit;

first switch means for connecting the outputs of both said left channel and said right channel record heads to said

first amplifier when said tape recorder and radio are decoupled whereby said tape recorder operates as a monaural recorder, said first switch means also for connecting said left channel and said right channel record heads to said third and fourth electrical connector means, respectively, when said tape recorder and radio are mechanically coupled to form a single integrated unit;

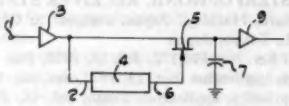
means for connecting said left and right channel signals to said left and right channel amplifiers, respectively, such that said tape recorder operates as a stereophonic tape recorder when said tape recorder and radio are mechanically coupled to form a single integrated unit.

4,151,471

SYSTEM FOR REDUCING NOISE TRANSIENTS

Thomas N. Packard, 4871 McDonald Rd., Syracuse, N.Y. 13215, and Richard C. Burns, 216 Stratford St., Syracuse, N.Y. 13210

Filed Nov. 4, 1977, Ser. No. 848,576
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—473 **10 Claims**



1. A system for reducing noise transients in a total input signal being transmitted over a channel, said total input signal including a carrier signal and noise transients, said system comprising:

blanking means actuable for limiting the amplitude of the total input signal to reduce the amplitude of the noise transients;

enabling means operatively associated with said blanking means for detecting noise transients in the total input signal and for selectively actuating said blanking means in response to the detection of a noise transient, said enabling means including:

threshold establishing means for continuously establishing a reference threshold signal according to the peak carrier signal amplitude occuring at prior time intervals; and

comparing means for comparing the total input signal with the reference threshold signal and for actuating said blanking means when the total input signal exceeds the reference threshold signal and for deactuating said blanking means when the value of the total input signal decreases to a predetermined relationship to the reference threshold signal.

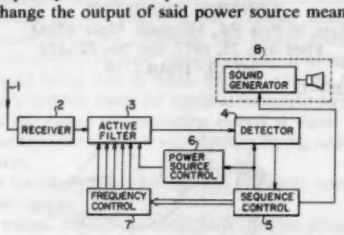
4,151,472

SELECTIVE CALLING CIRCUIT EMPLOYING CONTROLLED POWER SUPPLY THEREFOR

Eiji Watanabe; Junichi Onozawa; Jouji Tanaka; Takazo Takahashi; Tsuneo Kitamura; Hiroshi Yamada; Hiroshi Noguchi, and Yukio Ueno, all of Tokyo, Japan, assignors to Kokusai Electric Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1977, Ser. No. 851,374
Claims priority, application Japan, Aug. 22, 1977, 52-100280
Int. Cl.[2] H03K *17/26, 5/18*
U.S. Cl. 328—75 **2 Claims**

1. A selective calling circuit including band-pass filter means having its center frequency changeable so as to sequentially pass therethrough a plurality of tone signals arriving in succession in accordance with a predetermined code and power source means for energizing said band-pass filter means, the improvement comprising means for generating a control signal having a predetermined duration in accordance with the output of said band-pass filter means at a point of time whereat said output reaches a predetermined level, and means responsive to said control signal to establish a state in which the center frequency of said band-pass filter means can be changed and to change the output of said power source means from a



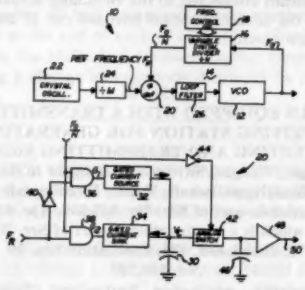
first level whereat said band-pass filter means may be energized to a second level whereat said band-pass filter means may be deenergized, for a period of time substantially corresponding to said predetermined duration of said control signal.

4,151,473

PHASE DETECTOR CIRCUIT

John R. Coleman, Palm Bay, Fla., and Clyde Washburn, Fairport, N.Y., assignors to Harris Corporation, Cleveland, Ohio

Filed Nov. 18, 1977, Ser. No. 852,676
Int. Cl.[2] H03B *3/04*; G11C *27/02*
U.S. Cl. 328—134 **6 Claims**



1. A circuit responsive to first and second input signals for providing an output signal having a level indicating the phase difference between said first and second signals, comprising:

capacitor means responsive to currents supplied thereto for developing a signal thereacross having a level corresponding to the integral of said currents supplied thereto;

current source means responsive to a first gating signal for sourcing current to said capacitor means;

current sink means responsive to a second gating signal for sinking current from said capacitor means;

gating signal supply means responsive to said first input signal for alternately, and in synchronism with said first signal, providing said first gating signal to said current source means and then said second gating signal to said current sink means whereby current is alternately sourced to and then sinked from said capacitor means so that a periodic waveform is developed across said capacitor means, said waveform being synchronized with said first input signal; and,

output means for sampling the level of said waveform at intervals in synchronism with said second signal and for also disabling said first and second gating signals during said sampling whereby the level of said waveform is substantially constant during said sampling, said output means providing an output signal having a level corresponding to the level of said waveform during said sampling, said level of said output signal thus indicating the phase difference between said first and second signals.

4,151,474
VARIABLE BANDWIDTH PASS-BAND FILTER

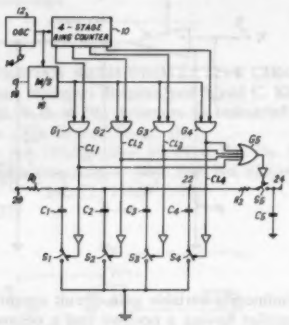
Geoffrey G. Woollvin, Hertfordshire, and Mieczyslaw Bilogan, Essex, both of England, assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 18, 1977, Ser. No. 825,767

Claims priority, application United Kingdom, Aug. 20, 1976, 34855/76

Int. Cl.² H03H *7/12*

U.S. Cl. 328—167 **5 Claims**



1. In a switched multipath variable pass-band filter network comprising a plurality N of low pass filters operating in parallel under the control of cyclically operated switches such that the network has the characteristics of a bandpass filter with its pass-band centered on a frequency which is determined by the frequency of the switch operating cycle, the improvement comprising variable pulse width generating and logic gating means for varying the duty cycles of the switches in a range not exceeding 1/N, the low pass filters providing a purely resistive path from the input to the output of the filter network when no low pass filter is operating, switching means controlled synchronously with the cyclically operated switches to interrupt the connection of the filters to the output of the filter network when no low pass filter is operating, and a smoothing circuit connected to the output of the filter network.

4,151,475
COMPENSATION CIRCUIT FOR MULTI-PATH PROPAGATION DISTORTION IN BINARY FREQUENCY MODULATED SIGNALS

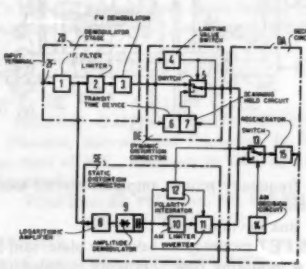
Jans-Jürgen von der Neyen, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,679

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714439

Int. Cl.² H04L *27/14*

U.S. Cl. 329—105 **7 Claims**



1. A system for the reception of digital communication signals which are impressed on a carrier in the form of a binary frequency modulation, through a propagation medium that may have multi-path wave propagation and in particular for reception by mobile stations, long-distance traffic and scattered-ray systems in which information losses occurring as a result of phase and amplitude distortions are automatically detected in two mutually supplementary arrangements, one of which has a frequency discriminator, behind which a device for recognizing interference peaks caused by reflection distortions is connected, a circuit which compensates for these interference peaks, and the other arrangement contains an amplitude demodulator, which is connected in parallel with the frequency demodulator in another branch, wherein the outputs of both demodulators are supplied to a switch which is controlled by an amplitude modulation evaluation device and which with a detectable amplitude modulation of sufficient magnitude connects the amplitude demodulator, and which with detectable frequency modulation, connects the frequency discriminator, together with the interference-peck-recognizer, to a common output, and wherein the output of the AM demodulator includes a polarization inverter connected after it which is controlled by a polarity integrator, that reverses the AM demodulation product as a function of the height of the FM demodulation product characterized in that said AM demodulator contains at its output an alternating voltage separating circuit which includes a first and second sampling circuit (**16**, **17**) with the second sampling circuit connected in parallel with the first sampling circuit, the first of said sampling circuits (**16**) controlled directly and the second sampling circuit (**17**) indirectly controlled with a switch (**22**), by a pulse (T) derived at the receiver from the incoming signal, said alternating voltage separating circuit contains at its output side, a subtractor (**18**) which receives inputs from said first and second sampling circuits, and said switch for the pulse feed to said second sampling circuit is actuated as a function of the changes in amplitude characteristic of the output signal of said first sampling circuit.

4. An alternating voltage separating circuit for an AM demodulator for a digital communication system comprising, first and second sampling circuits each receiving the output of said AM demodulator, a subtractor receiving the outputs of said first and second sampling circits, and a pulse source connected to said first and second sampling circuits.

4,151,476
MAGNETIC BUBBLE TRAVELING WAVE AMPLIFIER

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1978, Ser. No. 933,702

Int. Cl.² H03F *3/58*

U.S. Cl. 330—43 **11 Claims**

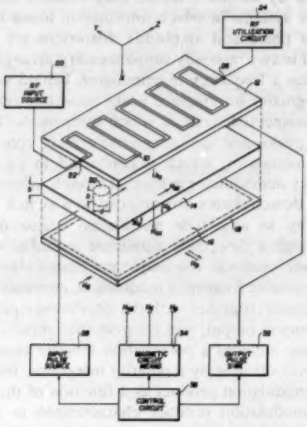
1. A circuit arrangement for amplifying an electromagnetic wave comprising the combination:

a slow wave structure coupled to an electromagnetic wave source for propagating an electromagnetic wave thereon from one end to the other;

a medium located adjacent said slow wave structure which is adapted to sustain and translate magnetic domains therein, said domains providing magnetic surface charges on said medium which is adapted to interact with said electromagnetic wave; and

means located adjacent said medium for translating said magnetic domains from input to output positions at substantially the same velocity as said electromagnetic waves

propagates from said one end to the other whereby energy is transferred from said magnetic surface charges to said



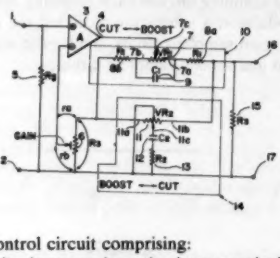
electromagnetic wave providing amplification of said wave.

4,151,477

TONE CONTROL CIRCUIT

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 23, 1977, Ser. No. 835,926
Claims priority, application Japan, Sep. 25, 1976, 51-115207
Int. Cl.[2] H03F *1/34*
U.S. Cl. 330—107 **4 Claims**



1. A tone control circuit comprising:

an amplifier having a non-inverting input terminal, an inverting input terminal and an output terminal, said non-inverting terminal being an input terminal to said tone control circuit,

a bass control circuit including a first variable resistor having a movable contact connected to output terminal of said amplifier, a first resistor connected between one end of said first variable resistor and said inverting input terminal, a second resistor connected between the other end of said first variable resistor and an output terminal of said tone control circuit, the resistances of said first and second resistors being equal, and capacitance means connected in parallel with said first variable resistor,

a treble control circuit including a second variable resistor and connected in parallel with said bass control circuit, and

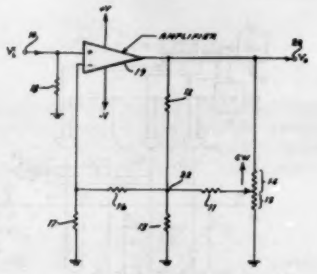
a gain control circuit including a third variable resistor connected between said first resistor and ground, said third variable resistor having a movable contact connected to said inverting input terminal of said amplifier.

4,151,478

NONLINEARLY VARIABLE GAIN APPARATUS

Eric C. Heinrich, Seminole, and William H. Mosley, Jr., St. Petersburg, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,433
Int. Cl.[2] H03F *1/36*
U.S. Cl. 330—108 **1 Claim**



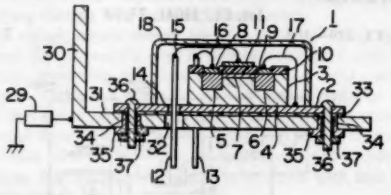
1. A nonlinearly variable gain circuit comprising an operational amplifier having a positive and a negative input and a single output, said positive input receiving an input voltage, a preselected first resistor connected from said positive input to ground, second and third preselected resistors in series connected from said single output to ground, a fourth preselected resistor connected between said second and third resistor to said negative input to provide a feedback path for said operational amplifier, a fifth preselected resistor connected from said negative input to ground, a linear resistor taper potentiometer having a taper arm, the total resistance thereof being connected from the output of said operational amplifier to ground, and a sixth preselected resistor connected from between said second and third resistor to said taper arm so that the circuit produces an inverted logarithmic S curve of gain versus potentiometer rotation while using a linear resistance taper potentiometer.

4,151,479

LOW FREQUENCY POWER AMPLIFIER USING MOS FET'S

Tatsuo Baba, Toyokawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 13, 1978, Ser. No. 895,978
Claims priority, application Japan, Apr. 13, 1977, 52/41450
Int. Cl.[2] H03F *3/21*
U.S. Cl. 330—264 **7 Claims**



1. A low frequency power amplifier circuit using a MOS FET, comprising:

(a) a heat sink having a base plate;

(b) a MOS FET mounted on said base plate, said MOS FET having a mounting base thermally coupled to said base plate, and a semiconductor device unit including a source electrode, a drain electrode formed in a substrate which is mounted on said mounting base and a gate electrode, said

source electrode being electrically connected to said mounting base;

(c) means for supplying an audio frequency signal to said gate electrode;

(d) a load connected between said source electrode and ground and adapted to be powered with an amplified audio frequency signal;

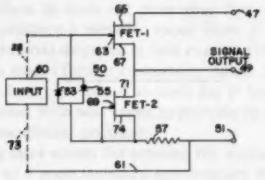
(e) a D.C. power source connected between said drain electrode and ground; and

(f) an impedance element connected between said heat sink and ground and having a larger impedance than an impedance of said load.

4,151,480
FET AMPLIFIER WITH PROTECTIVE CIRCUIT

Elmer V. Carlson, Prospect Heights, and Mead C. Killion, Elk Grove Village, both of Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Division of Ser. No. 755,468, Dec. 30, 1976, Pat. No. 4,063,505. This application Aug. 1, 1977, Ser. No. 820,404
Int. Cl.² H03F *3/185*
U.S. Cl. 330—277 **1 Claim**



1. An amplification circuit connectable to a voltage power source in the range of 0.9 to 2.0 volts, comprising at least two field effect transistors (FET's) each having at least three electrodes, one electrode of the first FET connected to one terminal of the power source, a diode biasing means comprising at least two diodes connected in parallel, said diodes being respectively connected with a polarity to pass current in relatively opposite directions, the second electrode of said first FET connected for receiving an AC signal and also connected to one terminal of the biasing means, the third electrode of said first FET connected to the first electrode of said second FET, the second and third electrodes of said second FET connected to the other terminal of the biasing means, means for coupling out the amplified AC signal generated across the first to the third electrodes of said second FET whereby said second FET functions to provide a low DC load impedance and a high AC load impedance, and a resistance means connected from the second and third electrodes of said second FET to the other terminal of the power source, whereby said resistance means is effectively connected in series with the DC current path traceable from the first to the third electrodes of each said FET's and between the diode biasing means and the other terminal of the power source to thereby limit the current flow through said FET's and also through said diode biasing means to provide protection therefor such as against electrostatic discharges.

4,151,481
DIGITAL GAIN CONTROL SYSTEM

David L. Funston, Batavia, and Zachariah H. Milburn, Jr., Amherst, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

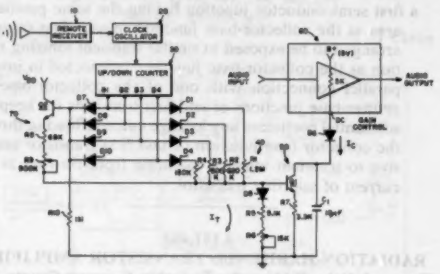
Filed Dec. 22, 1977, Ser. No. 863,151
Int. Cl.² H03G *3/10*
U.S. Cl. 330—279 **16 Claims**

1. A digital gain control system for controlling the gain of a gain-controllable amplifier, the system comprising: an oscillator;

an N-stage counter having an input coupled to the counter of the oscillator whereby 2^N digital counter output states are developed in response to the output of the oscillator;

a D/A converter coupled to the counter for developing an analog signal of 2^N-1 increments in response to the digital output states of the counter;

control signal developing means having an input coupled to the output of the D/A converter and an output coupled to the amplifier, said means responsive to the output of the D/A converter so that its output, and hence the gain of



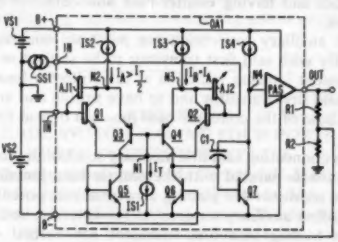
the amplifier, vary in response to the output of the D/A converter;

pre-adjusting means having an input coupled to the output counter and an output coupled to the control signal developing means, said means for supplementing the output of the D/A converter in response to the counter output so that the magnitude of the initial increment in control signal as the counter goes from the ZEROth state to the state immediately subsequent is greater than the subsequent 2^N—2 increments.

4,151,482
FOLDED-CASCODE AMPLIFIER STAGES

Thomas J. Robe, Bridgewater Township, Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,883
Int. Cl.² H03F *3/08*
U.S. Cl. 330—308 **8 Claims**



1. A folded-cascode amplifier comprising:

first and second transistors respectively of first and second complementary conductivity types, each of said first and second transistors having respective base and emitter and collector electrodes and having collector-base and emitter-base junctions;

means for applying a substantially unidirectional current with input signal variations between the emitter and base electrodes of said first transistor, responsive to which the emitter potential of said first transistor is subject to change respective to the potential at a point of fixed reference potential;

first current source means for supplying the combined quiescent collector current of said first transistor and quiescent emitter current of said second transistor to a node to

which the collector electrode of said first transistor and the emitter electrode of said second transistor each connect;

means applying the emitter potential of said first transistor to the base electrode of said second transistor for causing the base potential of said second transistor to follow the emitter potential of said first transistor;

load means having a direct current conductive path therethrough connecting the collector electrode of said second transistor to said point of fixed reference potential; and

a first semiconductor junction having the same profile and area as the collector-base junction of said first transistor arranged to be exposed to similar transient ionizing radiation as the collector-base junction, connected in inverse-parallel connection with one of the collector-base and emitter-base junctions of said first transistor for keeping a substantial portion of any leakage current flowing through the collector-base junction of said first transistor responsive to transient ionizing radiation from flowing as base current of said first transistor.

4,151,483

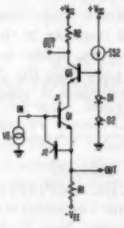
RADIATION-HARDENED TRANSISTOR AMPLIFIERS

Thomas J. Robe, Bridgewater Township, Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,993

Int. Cl.[2] H03F *3/08*

U.S. Cl. 330—308 **16 Claims**



1. Radiation-hardened transistor circuitry comprising:

a first transistor having base, emitter and collector electrodes and having emitter-base and collector-base junctions;

a first auxiliary semiconductor junction constructed integrally with said first transistor to be subject to the same transient ionizing radiation as the collector-base junction of said first transistor and to have profile and area similar to those of the collector-base junction of said first transistor;

means connecting said first auxiliary semiconductor junction in inverse-parallel with the emitter-base junction of said first transistor for placing a reverse-bias potential across said first auxiliary semiconductor junction; and

means biasing said first transistor for normal operation, which means includes means for constraining the base-to-collector potential of said first transistor to be substantially equal to said reverse-bias potential.

4,151,484

RADIATION-HARDENED TRANSISTOR AMPLIFIERS

Thomas J. Robe, Basking Ridge, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,999

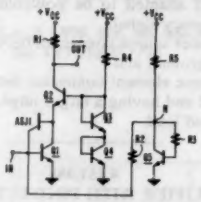
Int. Cl.[2] H03F *3/08*

U.S. Cl. 330—308 **5 Claims**

1. A radiation-hardened circuit comprising:

a first transistor having base and emitter and collector electrodes and having a collector-base junction between its collector and base electrodes;

a first auxiliary semiconductor junction similar in profile and area to said collector-base junction, said first auxiliary semiconductor junction being arranged with respect to the collector-base junction of said first transistor to be subject to similar transient ionizing radiation and connected in a first inverse-parallel connection with the collector-base junction of said first transistor; and



means for maintaining the potential across each of said junctions in said first inverse-parallel connection substantially zero.

4,151,485

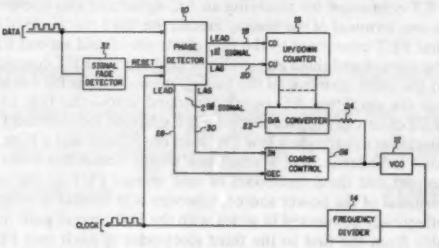
DIGITAL CLOCK RECOVERY CIRCUIT

Laurence A. LaFratta, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 21, 1977, Ser. No. 853,149

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—1 A **9 Claims**



7. In combination with a digital phase locked-loop circuit having a voltage controlled oscillator for providing a clock signal that tracks a pulse stream data signal under the control of the output of an up/down digital counter via a digital-/analog converter and a phase detector for effecting a count change in the counter whenever the phase difference between the data and clock signals exceeds a first threshold, the direction of change being such as to reduce the aforesaid phase difference, a coarse control circuit comprising:

means for generating and combining with the converter output a voltage to reduce the phase difference whenever it exceeds a second threshold which is greater than the first threshold;

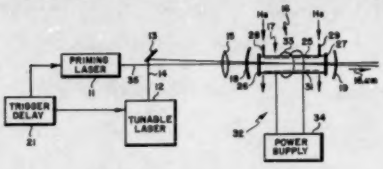
means for applying the combined voltage to the oscillator, and

means for terminating the generated voltage whenever the aforesaid phase difference falls below the first threshold.

4,151,486
TUNABLE ALKALI METALLIC VAPOR LASER

Irving Itzkan, Boston, and Robert T. V. Kung, Andover, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Mar. 9, 1977, Ser. No. 776,014
Int. Cl.[2] H01S *3/094*
U.S. Cl. 331—94.5 P 15 Claims



1. A tunable pulse laser system comprising:

(a) a resonant optical cavity comprising heat pipe means disposed between a pair of mirrors, said heat pipe means comprising a chamber having an evaporation portion intermediate its ends for providing therein at subatmospheric pressure a metallic vapor from a metallic vapor source material disposed in said evaporation portion, said heat pipe means further comprising means for introducing into said heat pipe means an inert gas at least a portion of which mixes with said vapor to provide an active medium at subatmospheric pressure;

(b) priming laser means for priming the vapor of said active medium to a predetermined intermediate level;

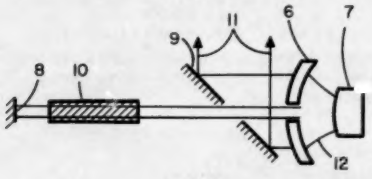
(c) tunable laser means for pumping said primed vapor to a virtual upper laser level adjacent a predetermined upper level and producing an output laser beam, said predetermined upper level being one to which a transition from said intermediate level is an optically allowed transition; and

(d) delay trigger circuit means for triggering said pumping laser with respect to said priming laser after said priming laser has been triggered and during the time said active medium is primed to said intermediate level by said priming laser.

4,151,487
LASER CAVITY STRUCTURE

Chang Hwi Chi, 1634 Aspenwall Rd., Westlake Village, Calif. 91361

Filed Sep. 12, 1977, Ser. No. 832,377
Int. Cl.[2] H01S *3/081*
U.S. Cl. 331—94.5 C 11 Claims

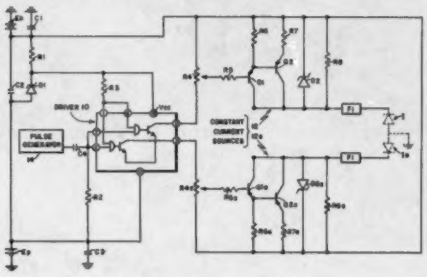


1. A laser cavity which comprises two cavity mirrors wherein one has a hole, a laser gain medium located external to the said cavity collinear to the position of said hole, a relaying optical means located between said cavity and said laser gain medium, a reflecting mirror located collinear to said hole and said gain medium and located beyond the said gain medium from the said hole and an energy "siphoning means to output a part of cavity mode energy, and wherein the curvatures of the said cavity mirrors are such as to form a resonator cavity, and the curvatures of said cavity mirror without hole and reflecting mirror are such that no laser oscillation is sustainable between them alone for said gain medium.

4,151,488
PULSED POWER SUPPLY

Ronald M. Wallace, Braintree, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 22, 1978, Ser. No. 880,264
Int. Cl.[2] H03B *7/06*
U.S. Cl. 331—107 R 1 Claim



1. A power supply for a solid state diode oscillator comprising:

(a) means, including a dropping resistor connected between a first electrical power source and a solid state diode oscillator, for maintaining a voltage across such diode equal to the threshold voltage therefor;

(b) means, including a normally nonconducting transistor, connected in parallel with the dropping resistor for effectively shorting out such resistor whenever the normally nonconducting transistor is rendered conducting;

(c) a pulse generator for periodically producing pulses when the normally nonconducting transistor is to be rendered conducting; and

(d) logic circuitry, coupled through a capacitor to the pulse generator and coupled through resistors to a second electrical power source and to the first electrical power source, for providing a drive signal to render the normally nonconducting transistor conducting whenever a pulse is produced by the pulse generator.

4,151,489
WAVEGUIDE SWITCH HAVING FOUR PORTS AND THREE CONNECTING STATES

Arnold L. Berman, Kensington, Md.; Christoph E. Mahle, Washington, D.C., and Francois T. Assal, Bethesda, Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Nov. 15, 1977, Ser. No. 851,659
Int. Cl.[2] H01P *1/12, 1/14, 1/15*
U.S. Cl. 333—103 5 Claims

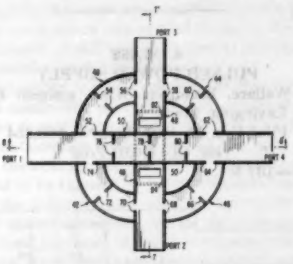
1. A microwave switch for switching two independent microwave signals, comprising:

four waveguide ports;

six waveguide transmission means for providing transmission paths for microwave signals, each of said ports being electrically connected to each of the remaining said ports by one of said waveguide transmission means;

at least one tuning means for each of said waveguide transmission paths for switching between a first state wherein the passband of said waveguide transmission means is unchanged and a second state wherein said passband of said transmission means is detuned such that the incident microwave signals are reflected and not propagated therethrough, said tuning means for all said waveguide trans-

mission paths being independently switchable between said first and second states, whereby any two of said ports



may be electrically connected together independently of the remaining two of said ports.

4,151,490

AUTOMATIC CABLE EQUALIZER CIRCUIT

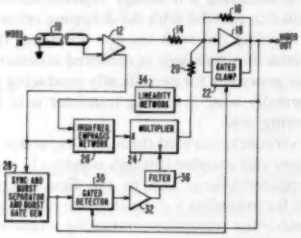
Lucas J. Bazin, Vincentown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,291

Claims priority, application United Kingdom, Mar. 21, 1977, 11903/77

Int. Cl.[2] H04B 3/14; H04N 9/535

U.S. Cl. 333—16 **2 Claims**



1. A signal cable equalizer circuit for automatically compensating signals transmitted over a cable, said cable signals incurring amplitude and frequency response losses during said transmission, comprising:

means for including a reference signal having both low and high frequency components in said cable signals to be transmitted, said reference signal components exhibiting a relative difference in amplitude as a result of transmission losses;

signal summing means responsive to said cable signals for providing an output signal;

signal processing means coupled to said cable signals for developing a correction signal which is complementary to cable loss for all frequencies transmitted over said cable for a predetermined length of cable derived from said cable signals;

detector means coupled to said signal summing means for developing a control signal proportional to the relative amplitude difference between said low and high frequency reference signal components; and

multiplier means responsive to said correction signal and said control signal for coupling an amount of said correction signal as determined by said control signal to said signal summing means for restoring the amplitude of said output signal.

4,151,491

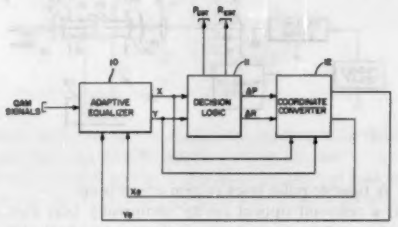
TECHNIQUE FOR SUPPLYING REFERENCE FOR AN ADAPTIVE EQUALIZER WHEN MULTIPLE PHASE SIGNALS ARE TRANSMITTED

Daniel D. McRae, West Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 28, 1977, Ser. No. 837,355

Int. Cl.[2] H04B 3/04; H03H 7/16

U.S. Cl. 333—18 **10 Claims**



1. In a communication system wherein received multiple phase modulated signals are processed through an adaptive equalizer and equalizer parameters are modified in accordance with the degree of determined error in the amplitude and phase of decided signal values, relative to received signal values, an improved technique for supplying equalizer parameter modifier signals and thereby continuously update the operation of the equalizer in accordance with the characteristics of the received data comprising the steps of:

aligning a first signal vector representative of the error in the amplitude of a received signal vector, relative to that of the estimated amplitude of its corresponding actually transmitted signal vector, in the direction of and at the tip of said received signal vector,

aligning a second signal vector representative of the error in phase of said received signal vector, relative to that of the estimated phase of said corresponding actually transmitted signal vector, in a direction orthogonal to and at the tip of said aligned first signal vector,

generating a pair of signals respectively representative of the orthogonal components of which the signal resulting from the vector sum of said first and second signal vectors is comprised, and

supplying said pair of signals to said adaptive equalizer for modifying said equalizer parameters in accordance therewith.

4,151,492

SURFACE ACOUSTIC WAVE GRATING

Frank Sandy, Lexington, and Clarence J. Dunnrowicz, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 16, 1978, Ser. No. 869,880

Int. Cl.[2] H03H 9/02, 9/32, 9/26

U.S. Cl. 333—191 **6 Claims**

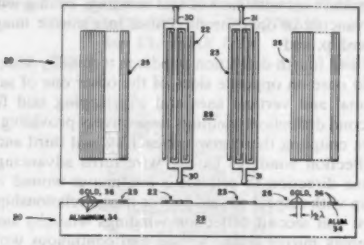
1. A surface acoustic wave device comprising:

a substrate having a surface thereon for propagating a surface acoustic wave;

a grating positioned on said surface, said grating having a thickness much smaller than a wavelength of said surface acoustic wave, said grating having a length and a width much greater than a wavelength of said surface acoustic wave; and wherein

said grating is composed of contiguous strips of first and second materials having respectively first and second densities the difference in density between the density of said first material and the density of said substrate being

relatively large while the difference in the density of said second material and the density of said substrate is relatively small to promote increased reflectivity of surface acoustic waves impinging upon said grating.

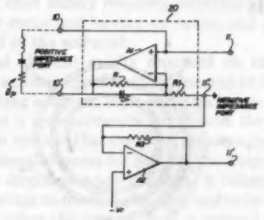


4,151,493

NEGATIVE IMPEDANCE CONVERTERS

Ted J. Lewandowski, Arnprior, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 3, 1977, Ser. No. 838,761
Int. Cl.² H03H *7/00*
U.S. Cl. 333—216 **6 Claims**



1. An improved negative impedance converter comprising: a conventional negative impedance converter having a negative impedance port and a positive impedance port; a first differential operational amplifier having an inverting input and a non-inverting input and an output; said inverting input receiving one side of said negative impedance port; said non-inverting input receiving a reference voltage; and said output forming, with the other side of said negative impedance port, the output of said improved negative impedance converter.

4,151,494

ELECTRICAL FILTER

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, Kyoto; Sadahiro Tamura, Kyoto, and Sadao Yamashita, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

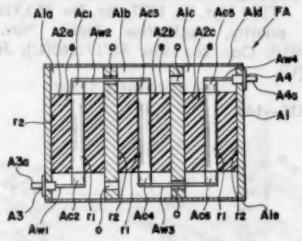
Filed Jan. 24, 1977, Ser. No. 762,187
Claims priority, application Japan, Feb. 10, 1976, 51-13353; Feb. 10, 1976, 51-13354; Feb. 10, 1976, 51-13355; Feb. 10, 1976, 51-13356; Feb. 10, 1976, 51-13357; Feb. 10, 1976, 51-13358
Int. Cl.² H01P *1/20*
U.S. Cl. 333—204 **25 Claims**

1. An electrical filter comprising:

an electrically conductive housing means having at least one cylindrical bore therein;

at least one resonator means disposed in said at least one bore of said housing means, said resonator means including a cylindrical dielectric member having a coaxial bore therein, an outer conductor member disposed on the outer periphery of said dielectric member and electrically connected to said housing means, and an inner conductor member disposed on the periphery of said coaxial bore of said dielectric member;

an input means for applying electrical signals to said electrical filter;



an output means for removing electrical signals from said electrical filter; and

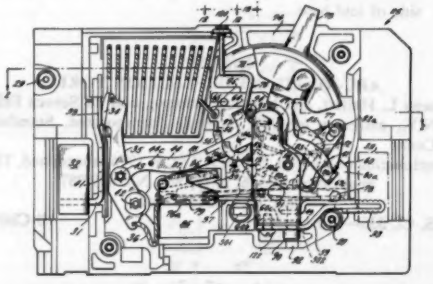
a coupling means for electrically coupling said input means, said resonator means and said output means in series.

4,151,495

RESETTING MEANS FOR TRIP FREE CIRCUIT BREAKER CONTACT OPERATING MECHANISM

Tadeusz J. Rys, and Bernard DiMarco, both of Bellefontaine, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 20, 1977, Ser. No. 817,357
Int. Cl.² H01H *73/24*
U.S. Cl. 335—26 **10 Claims**



1. A circuit breaker including cooperating contact means and a spring powered trip free operating mechanism for opening and closing the contact means; said mechanism including a cradle operable between a tripped position wherein the contact means are open and a reset position wherein said contact means may be closed, an operating member for actuating the mechanism to open and close the contacts when the cradle is in said reset position, and a reset link through which force applied to said operating member is transmitted to said cradle for moving the latter from said tripped position to said reset position.

4,151,496
STEPPING RELAY HAVING A SINGLE MOUNTING MEMBER

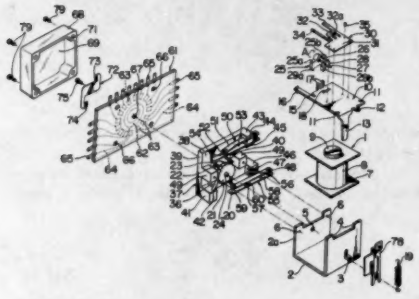
Yoshikiyo Imai, Moriyama, and Syunichi Agatahama, both of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 22, 1977, Ser. No. 853,910

Claims priority, application Japan, Nov. 22, 1976, 51/156546[U]; Dec. 20, 1976, 51/171265[U]; Jun. 20, 1977, 52/81318[U]

Int. Cl.[2] H01H *51/08*

U.S. Cl. 335—140 **5 Claims**



1. A stepping relay comprising:

a base made of an insulator;

an electromagnet having a U-shaped yoke, and being mounted on a first side of said base;

a pawl rotatably mounted on an armature of said electromagnet, and being located on said first side of said base;

a ratchet rotatably supported by and between said base and said U-shaped yoke, and being actuated by said pawl when said electromagnet is energized, and being located on said first side of said base;

a printed circuit board on which a common contact and circular contacts are printed, said printed circuit board being mounted on a second side of said base, said second side being in the back of said first side; and,

a slider mounted on a main shaft of said ratchet, and having a first and a second sliding contacts which are rotationally slidable on said common contact and said circular contacts respectively, and being located on said second side of said base.

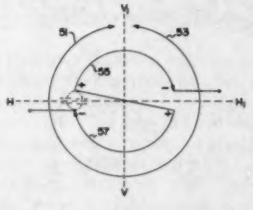
4,151,497
ARC-RESISTANT DEFLECTION YOKE

Joseph L. Hallett, and Martin Fischman, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 673,693, Apr. 5, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,987

Int. Cl.[2] H01J *29/66*

U.S. Cl. 335—213 **5 Claims**



1. In a cathode ray tube deflection system for a color television receiver, an arc resistant deflection yoke comprising:

a substantially circular core of magnetic material having horizontal and vertical axes;

first and second deflection windings toroidally wrapped on said core on opposite sides of one of said horizontal and vertical axes with each of said windings having wire turns advancing in opposite directions in a mirror image relationship; and

third and fourth deflection windings toroidally wrapped on said core on opposite sides of the other one of said horizontal and vertical axes and overlapping said first and second deflection windings respectively providing capacitive coupling therebetween, each of said third and fourth deflection windings having wire turns advancing in the same direction to provide a continuous-wound relationship with respect to said mirror image relationship of said first and second deflection windings whereby said overlapping mirror image wound and continuous wound deflection windings provide a less efficient transformer and less efficient transfer system for undesired arc signals as compared with mirror image wound, mirror image wound deflection windings.

4,151,498
COMBINED SUPERCONDUCTING COIL

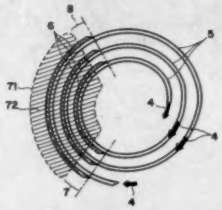
Makoto Katsurai, 3-36-15, Nishihara, Shibuya-ku, Tokyo 151, Japan

Filed Jun. 27, 1977, Ser. No. 810,683

Claims priority, application Japan, Jul. 5, 1976, 51-079031

Int. Cl.[2] H01F *7/22*

U.S. Cl. 335—216 **16 Claims**



1. A combined superconducting coil comprising:

a coil winding formed by a first composite superconducting wire of fully stabilized type having core wires of a first kind of superconducting material, for generating a strong magnetic field exceeding a critical value in at least one part of respective turns in at least one part of said coil winding when an exciting current is applied to said coil winding,

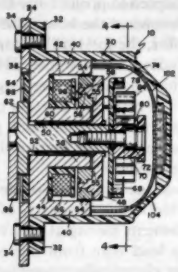
a plurality of partial by-pass wires formed by a second composite superconducting wire of fully stabilized type having core wires of a second kind of superconducting material, said partial by-pass wires being arranged along and in contact with said coil winding so that said plurality of partial by-pass wires form by-passes for said exciting current along portions of said coil winding where said strong magnetic field exceeds the critical value, the length of said partial by-pass wire being so selected that both ends of said partial by-pass wire extend beyond said portions of said coil winding, and said partial by-pass wire having such a high critical magnetic field as maintaining superconductivity even in said magnetic field exceeding the critical value of the first kind of superconducting material, and

a plurality of flow passages for circulating extremely low temperature helium between respective turns of said coil winding so that said extremely low temperature helium is in direct contact with at least one surface of at least one of said coil winding and said partial by-pass wires, whereby heat generated in the vicinity of said both ends of said partial by-pass wires is promptly dissipated in said extremely low temperature helium.

4,151,499
ROTARY SOLENOID WITH INDIRECTLY COUPLED OUTPUT SHAFT

Raymond J. Ganowsky, St. George, Utah and Alvin P. Fenton, Oostburg, Wis., assignors to Kohler Company, Kohler, Wis.

Filed Feb. 22, 1977, Ser. No. 770,619
Int. Cl.[2] H01F 7/14
U.S. Cl. 335—272 10 Claims



1. A rotary solenoid, comprising a stator; a rotor; and an energizing coil; wherein the rotor is rotatable between a first position when the coil is energized and a second position when the coil is not energized, said rotary solenoid further comprising

an output shaft axially rotatably mounted through the rotor and the stator and having an output end projecting from one end of the solenoid;

a torsional element axially mounted on the output shaft, having an inner end fixedly connected to the output shaft, and having a tongue at an outer end extending in a direction that is approximately radial from the output shaft;

a drive pin mounted on the rotor for engaging the tongue of the torsional element for rotating the output shaft in a first angular direction when the rotor is rotated from the second position to the first position, and to be engaged by the tongue when the output shaft is rotated in the opposite angular direction to enable the rotor to be rotated to the second position; and

means coupled to the output shaft for biasing the output shaft for rotation in the opposite angular direction when the coil is not energized;

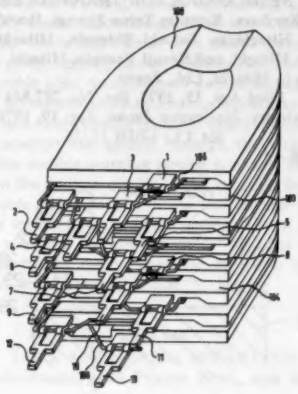
whereby the output shaft is rotated independently of the rotor by the torsional element.

4,151,500
LINE OUTPUT TRANSFORMER

Mario Malerba, and Massimo Galeotti, both of Turin, Italy, assignors to Indesit Industria Eletrodomestici Italiana S.p.A., Turin, Italy

Filed Nov. 9, 1977, Ser. No. 849,927
Claims priority, application Italy, Nov. 9, 1976, 69672 A/76
Int. Cl.[2] H01F 15/10, 27/30
U.S. Cl. 336—185 5 Claims

1. A line output transformer for a television receiver having a plurality of windings for connection to the line output stage and the deflection coil(s) of the receiver and for supplying voltage to auxiliary circuits of the receiver, the transformer further comprising a ferromagnetic core and an insulating support for at least some of the windings, the said support having a plurality of terminals connected to the ends of the windings and having a plurality of grooves, defined by insulating walls, for receiving the windings and insulating the windings from one another, a wall of at least one of the said grooves having a slot operative during winding to guide the starting end of a winding to the bottom of the groove and serving to inhibit contact between the said starting end and subsequent turns wound in the groove, wherein the said terminals are supported in the walls defining the grooves and are all arranged on the same side of the support whereby the ends of the terminals may be soldered onto a substantially flat printed circuit board, and wherein the said terminals each include an elongated tab stamped out of the terminals, the inner end of the tabs and the portion of the terminals adjacent to the inner end of the tab having oppositely curved notches whereby to enable

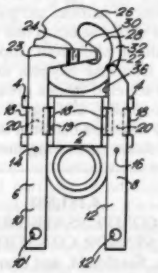


the winding wire to be drawn across the terminals in the direction of winding without bending and snapped into said notches to be gripped therebetween during winding, the tabs being capable of being clamped down after the windings have been wound to prevent release of the wire so as to enable a plurality of the windings to be wound consecutively without breaking the winding wire.

4,151,501
TERMINAL MOUNTING MEANS FOR THERMALLY ACTUATED SWITCHES

John C. Taylor, 9 Holmfield Park, Ballasalla, near Castletown, Isle of Man

Filed May 2, 1977, Ser. No. 792,549
Claims priority, application United Kingdom, May 7, 1976, 18897/76
Int. Cl.[2] H01H 61/00
U.S. Cl. 337—89 8 Claims



1. An electrical switch comprising an electrically insulative body member including flat portions on one side thereof, a pair of electrical terminals each having a pair of ears extending from one side of the terminals and integral with the terminals, said ears being crimped about the portions of the body member to resiliently secure the terminals to the body member, one of the terminals providing a stationary contact, the other terminal having an actuator mounted thereon, the actuator comprising a member of flexible bimetallic material having a tongue free at one end, the tongue being integral with and surrounded by a

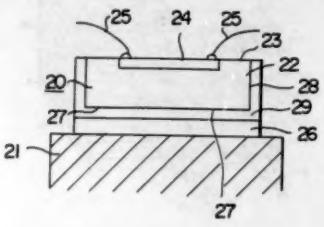
peripheral portion, the actuator being deformed to provide for movement of the actuator in response to changes in temperature, the actuator providing a movable electrical contact which makes electrical connection with the stationary contact.

4,151,502

SEMICONDUCTOR TRANSDUCER

Yasutoshi Kurihara, Katsuta; Tetuo Kosugi, Ibaraki; Teruyuki Kagami, Hitachiota; Satoshi Shimada, Hitachi; Yasumasa Matsuda, Hitachi, and Kazuji Yamada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1977, Ser. No. 787,841
Claims priority, application Japan, Apr. 19, 1976, 51-43581
Int. Cl.[2] G01B *11/16*
U.S. Cl. 338—2 **12 Claims**



1. A semiconductor transducer comprising:

a semiconductor strain gauge composed of a monocrystalline semiconducting material portion having a first main surface, a second main surface and a side surface, and a strain sensing region formed in said first main surface of said monocrystalline semiconducting material portion;

an electrical insulating layer covering said second main surface and said side surface of said mono-crystalline semiconducting material portion;

a strain measuring member at which strain to be sensed is caused; and

an alloy material interposed between said strain measuring member and that part of said electrical insulating layer which covers said second main surface of said mono-crystalline semiconducting material portion, for coupling said strain measuring member to said second main surface through said insulating layer,

wherein said electrical insulating layer is a very thin layer having a thickness of only several μm and is made of one material selected from a group consisting of silicon dioxide, alumina, silicon nitride, germanium dioxide, gallium arsenide doped with a selected one of chromium, iron and oxygen and gallium phosphide doped with a selected one of chromium, iron and oxygen, and wherein said alloy material is one selected from a group consisting of a gold-germanium group alloy and a gold-silicon group alloy and is continuously disposed between said electrical insulating layer and said strain measuring member.

4,151,503

TEMPERATURE COMPENSATED RESISTIVE EXHAUST GAS SENSOR CONSTRUCTION

Michael J. Cermak, Southfield, and Stanley R. Merchant, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1977, Ser. No. 839,704
Int. Cl.[2] G01N *27/12*
U.S. Cl. 338—14 **9 Claims**

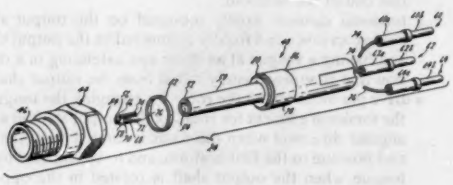
1. An improved sensor of the type adapted for installation in an exhaust manifold or exhaust conduit for conveying exhaust gases from an internal combustion engine, the improved sensor being responsive to the partial pressure of oxygen in the exhaust gases to which the sensor is exposed and having an electrical characteristic which varies, when the sensor is at operating temperatures in the range from about 700° F. to about 1500° F., with the partial pressure of oxygen in the exhaust gases, the sensor comprising:

a housing adapted for connection to the exhaust manifold or exhaust conduit of an internal combustion engine;

a ceramic insulator having a forwardly projecting sensor element support portion and a rearwardly extending terminal portion received within the housing and positioned such that the forwardly projecting sensor element support structure is adapted to project into the exhaust manifold or exhaust conduit when the housing is connected thereto as adapted therefor, the forwardly projecting portion of said insulator including a thin-walled cavity and at least first, second and third passages extending from the bottom of the cavity to the rearward portion of the insulator;

at least three electrical terminals each positioned within one of the three passages at the rearwardly extending terminal portion of the insulator;

a pair of series-connected metal-oxide ceramic sensing elements supported within the cavity of the insulator, each of the sensing elements having at least two lead wires embedded therein, a lead wire from one of said pair of sensing elements being electrically connected to a lead wire of the other of the sensing elements, a second lead wire from said one of said pair of sensing elements passing through a first passage in the insulator, a second lead wire from the other



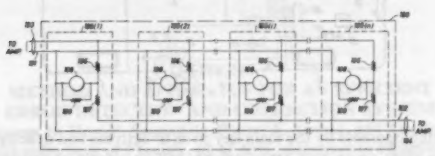
of said pair of sensing elements passing through a second passage in the insulator, and a third lead wire passing through a third passage in the insulator, the third lead wire being electrically connected to the electrically connected lead wires of said one and the other of said pair of sensing elements, the lead wires in the first, second and third passages of said insulator being connected, respectively, to the three electrical terminal members received within the passages, the lead wires from the sensing elements being operative to support the sensing elements in the cavity of the insulator, the cavity having a depth sufficient to shield the sensing elements from the direct flow of gaseous products of combustion in the exhaust manifold or exhaust conduit; and

said pair of sensing elements being exposed on all sides thereof to exhaust gases within the exhaust manifold or exhaust conduit, said one of said sensing elements having an electrical resistance which varies as a function of the temperature to which it is exposed and not substantially as a function of the partial pressure of oxygen to which it is exposed and the other of said sensing elements having an electrical characteristic responsive to both the temperature to which it is exposed and the partial pressure of the oxygen in the exhaust gases to which it is exposed when at a temperature within the range from about 700° F. to about 1500° F.

4,151,504
BIDIRECTIONAL SEISMIC ARRAY AND METHOD OF SEISMIC EXPLORATION

William H. Mayne; Algernon S. Badger, both of Houston, Tex., and William S. Hawes, deceased, late of Houston, Tex. (by Louise A. M. Hawes, administrator), assignors to Geosource Inc., Houston, Tex.

Continuation-in-part of Ser. No. 656,528, Feb. 9, 1976, Pat. No. 4,024,492. This application May 4, 1977, Ser. No. 793,756
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] G01V *1/20, 1/22*
U.S. Cl. 340—15.5 MC 56 Claims

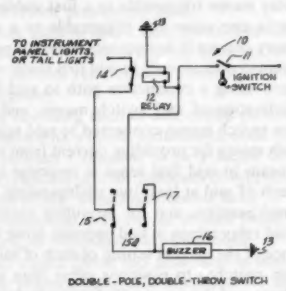


1. A bidirectional seismic array with first and second ends, comprising:
a plurality of seismic detector connection points;
a seismic detector connected at each seismic detector connection point;
circuitry for producing first and second separate and independent signals from the response of each seismic detector;
a first signal-carrying medium over which the first signals from all of the seismic detectors may be conveyed to the first end of the array;
a second signal-carrying medium over which the second signals from all of the seismic detectors may be conveyed to the second end of the array; and
circuitry for preventing the first signals at the first end of the array from interfering with the second signals at the second end of the array.

4,151,505
BUZZER WARNING CIRCUIT FOR AUTOMOBILE LIGHTS

Jerry E. Swinny, 6 Little Creek Estates, R.D. 1, Little Creek Dr., Rochester, Pa. 15074

Continuation of Ser. No. 732,312, Oct. 14, 1976, abandoned. This application May 2, 1978, Ser. No. 902,070
Int. Cl.[2] H02J *1/00*
U.S. Cl. 340—52 D 2 Claims

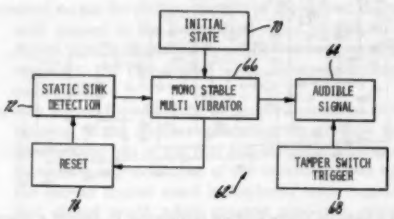


1. A warning circuit for an automotive headlamp circuit which is connected with and operated along with an instrument panel lighting circuit comprising a motor ignition switch operating an ignition circuit for said vehicle, a relay in series with said ignition circuit so as to be energized when the ignition circuit is energized, a normally closed electromagnetic switch in series with said instrument panel lighting circuit, said switch being opened by energizing said relay, an electrically energized audible warning device operatively connected to said normally closed electromagnetic switch and energized to emit a signal when said switch is in closed position and the instrument panel lighting circuit is energized, and a manually operable double pole, double throw switch having one pole in series with the normally closed electromagnetic switch and the other pole in a series circuit with the ignition circuit whereby in a first position the circuit through the electromagnetic switch to the audible warning device is closed and the series circuit from the ignition circuit to the warning device is open at said double pole, double throw switch and in a second position the series circuit from the ignition circuit to the warning device is closed and the circuit through the electromagnetic device to the audible warning device is open at said double pole, double throw switch.

4,151,506
LOCK AND ALARM APPARATUS

Wilhelm Schoenmetz, 1160 Pauline Blvd., Ann Arbor, Mich. 48103

Filed Sep. 20, 1976, Ser. No. 724,517
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—63 6 Claims



1. Alarm apparatus comprising a housing, said housing including means forming an access opening to the interior thereof, and further including a closure for said access opening, fastener means for securing said closure to said housing, said fastener means comprising at least one electrically conductive securing member, and a corresponding mounting member which is connected to said housing and to which said securing member is affixed in said secured position of said closure, said mounting member being formed of dielectric material and having a pair of spaced apart electrically conductive elements disposed therein that are electrically connected only when said securing member is in engagement with both of said elements, a power source, a connector element having a pair of ends and being formed at least partially of an electrically conductive material extending substantially over the entire length thereof, insulating means substantially surrounding said electrically conductive material, means for securing said ends of said connector element to said housing, warning signal means operable when electrically connected to said power source to emit a warning signal, control circuitry connected to said electrically conductive material and operable to provide for the operation of said warning signal means for a preset length of time in response to an electrically conductive contact with said conductive material, said control circuitry comprising detecting means having input means connected to said conductive material, resettable triggering means connected to said detecting means, actuating means connected to said triggering means, said actuating means including timer means and being operable when activated to connect said warning signal means to said

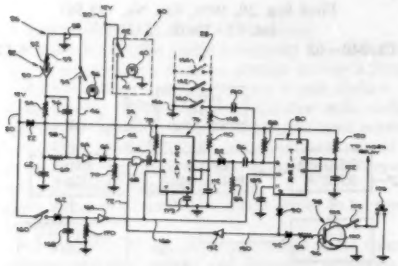
power source for said preset length of time, means for supplying a voltage to said input means, said detecting means providing a signal to said triggering means to initiate said actuating means to connect said warning signal means to said power source for said preset length of time in reponse to a preselected voltage variance from said voltage at said input means, said connector element and said control circuitry being connected so that said voltage is varied at said input means in response to an electrically conductive contact with said electrically conductive material thereby effecting a conductive path to said input means, and tamper circuitry operable to connect said warning signal means to said power source, said securing member and said elements forming an electrical path in said tamper circuitry in the secured position of said closure to said housing, said electrical path being interrupted in response to disengagement of said securing member with one of said elements thereby providing for the connection of said power source to said warning signal means to generate said warning signal.

4,151,507

VEHICLE ALARM SYSTEM

Billy R. Willis, 13135 Vanowen St., Apt. 5, North Hollywood, Calif. 91605

Filed Aug. 8, 1977, Ser. No. 822,698
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—64 **6 Claims**



1. In a vehicle alarm system responsive to any of a plurality of tamperings, in combination:

inverter means having an input terminal for receiving a tampering-produced first signal of a given polarity and producing therefrom a second signal of opposite polarity;

time delay means adapted to receive said second signal or a tampering-produced third signal of said opposite polarity and, after a predetermined time interval, producing therefrom a fourth signal;

and means adapted to receive said fourth signal or a fifth tampering-produced signal and producing therefrom an alarm signal.

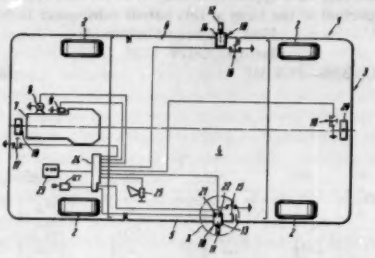
4,151,508

VEHICLE THEFT PROTECTION ARRANGEMENT

Paul Hensler, Stuttgart; Wolfgang Eyb, Leonberg; Richard Hetmann, Tamm, and Hermann Burst, Rutesheim, all of Fed. Rep. of Germany, assignors to Porsche AG, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,152
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645227
Int. Cl.[2] B60R *25/04*; G08B *13/22*
U.S. Cl. 340—64 **10 Claims**

1. A theft protection arrangement for vehicles, the vehicles being provided with vehicle doors having closing cylinders mounted therein, the arrangement including a lock system having a main key for locking and unlocking an ignition-starting lock arrangement as well as locking and unlocking the closing cylinders of the vehicle doors and for controlling an operation of the theft protection arrangement, and an auxiliary key for locking and unlocking only one of the closing cylinders and the ignition-starting lock arrangement, electrical contact switch means operatively associated with at least one of the vehicle doors, a vehicle hood, and a vehicle lid for monitoring a condition thereof, electrical contact means provided at one of the closing cylinders other than the closing cylinder which is lockable by the auxiliary key, the electrical contact means



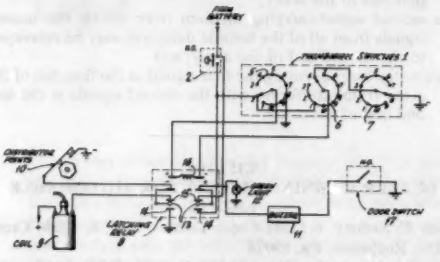
being operable by the main key so as to activate and deactivate the theft protection arrangement, and an electrical switching means operatively connected with said electrical contact switch means and the electrical contact means for at least one of activating an alarm system and disconnecting at least one means necessary for an operation of the vehicle upon an unauthorized entry of the vehicle doors, a vehicle hood, or a vehicle lid.

4,151,509

NUMBER GUARD ANTI-THEFT DEVICE

John Winiczei, 117-18 238th St., Elmont, N.Y. 11003

Filed Dec. 12, 1977, Ser. No. 859,641
Int. Cl.[2] B60R *25/04, 25/10*
U.S. Cl. 340—64 **8 Claims**



1. An anti-theft device for a vehicle having an electrical ignition system including a battery, comprising a mechanically latchable relay means triggerable to a first stable state by battery current in one sense and triggerable to a second stable state by battery current in an opposite sense for permitting said ignition system to operate only in said first stable state; a switch means for providing a conduction path to said battery in response to activation of said switch means, and at least two multiposition switch means connected to said relay means and to said switch means for providing current from said battery to said relay means in said first sense in response to the manual setting of each of said at least two multiposition switches to a predetermined position, and for providing current from said battery to said relay means in said opposite sense in response to a concurrence of the manual setting of each of said at least two multiposition switches to positions other than said predetermined positions and the provision of a conduction path to said battery through said switch means, whereby said vehicle ignition system is set to an operable condition in response to a

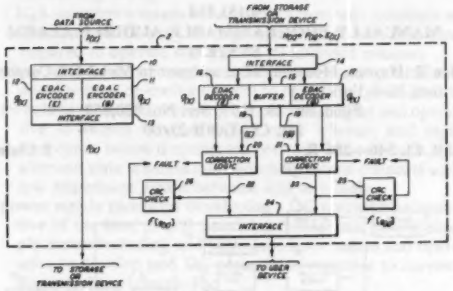
setting of the multiposition switches to their predetermined positions, and whereby the vehicle remains in the operable condition without drawing further battery current after the multiposition switches, having been set to their predetermined positions, are then set to other positions, and whereby the vehicle is set to an inoperable condition in response to activation of said switch after the multiposition switches have been set to positions other than the predetermined positions, said ignition system remaining in said inoperable condition without drawing further battery current after said switch is activated.

4,151,510

METHOD AND APPARATUS FOR AN EFFICIENT ERROR DETECTION AND CORRECTION SYSTEM

Thomas H. Howell, Scottsdale; Robert E. Scriver, and Joseph C. Circello, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems, Phoenix, Ariz.

Filed Apr. 27, 1978, Ser. No. 900,627
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AL **10 Claims**



1. A method for increasing the utility of coded check bits and reducing the probability of miscorrecting non-correctable error data in an error detection and correction system in which a coded data word made up of information bits and coded check bits is used to implement error detection and correction as well as to perform a cyclical redundancy code check for supplementary error detection comprising the steps of:

(a) partitioning a data word into at least two fields;

(b) encoding each of said partitioned fields with coded check bits derived in accordance with selected cyclic (EDAC) code generator polynomial g(x);

(c) decoding each of said coded partitioned fields in accordance with said selected EDAC code polynomial g(x) to provide an error syndrome for error detection and correction purposes;

(d) further decoding each of said coded partitoned fields in accordance with a cyclic redundance code (CRC) generator polynomial f selected to be a factor of said EDAC code polynomial g(x) for purposes of supplementary error detection of said coded partitioned field;

(e) interleaving said decoded partitioned fields, corrected as necessary, to reproduce said data word;

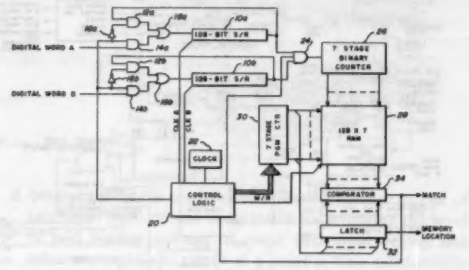
whereby said coded check bits generated in accordance with EDAC code polynomial g(x) are utilized for supplementary CRC error detection without the need to generate separate CRC check bits and the effect of said partitioning makes miscorrection of data a virtual impossibility.

4,151,511

DIGITAL CORRELATOR

Ivars P. Breikss, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 19, 1976, Ser. No. 743,259
Int. Cl.[2] G06F *15/34*
U.S. Cl. 340—146.2 **2 Claims**



1. A digital correlator for correlating first and second digital words, the digital correlator comprising:

comparing means for providing a comparison of individual bits of the first and second digital words during each of a plurality of comparison cycles and for providing a correlation signal each time a correlation occurs;

storing means for storing a number indicative of the number of correlation signals of each comparison cycle at a different location;

control means for shifting the bits of the second digital word with respect to the first digital word so that the second digital word is displaced by a different number of bits with respect to the first digital word during each comparison cycle; and

search means for searching the stored numbers to find the location of the number indicating the greatest similarity between the bits of the first and second digital words, the location being indicative of the number of bits by which the second digital word is displaced with respect to the first digital word when greatest similarity occurs, said search means including (1) latch means for storing numbers therein; (2) comparator means for comparing the number stored in the latch means with the stored numbers in the storing means; (3) decrementing means for decrementing the number stored in the latch means if none of the stored numbers in the storing means equal the number stored in the latch means; (4) and output means for providing an output derived from the location of the stored number which equals the number stored in the latch means.

4,151,512

AUTOMATIC PATTERN PROCESSING SYSTEM

John P. Riganati, Yorba Linda, and Visvaldis A. Vitols, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 10, 1976, Ser. No. 722,244
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 E **24 Claims**

1. A method of processing fingerprint patterns which are each characterized by ridge lines forming a contour pattern classifiable into one of a predetermined number of classification types, including the steps of:

providing a fingerprint pattern;

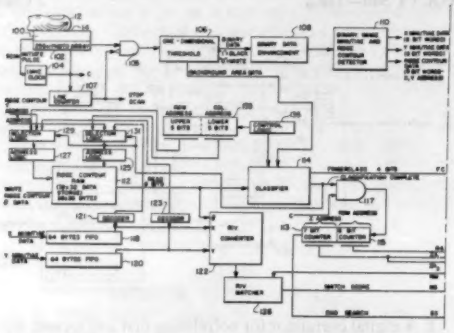
providing identifying information corresponding to said provided fingerprint;

extracting ridge contour data from said provided fingerprint corresponding to said contour pattern;

classifying said provided fingerprint pattern into one of said predetermined classification types; and

storing said identifying information according to said corresponding classification type;

said contour data extracting step including the steps of identifying contour lines in said fingerprint, determining average angle contour values of said identified contour lines for predetermined areas of said fingerprint, and storing



said average angle contour values to define said line contour data; and

said classifying step including the steps of identifying the occurrence of tri-radii points from said line contour data, and representing three contour lines uniquely associated with each identified tri-radii point.

4,151,513

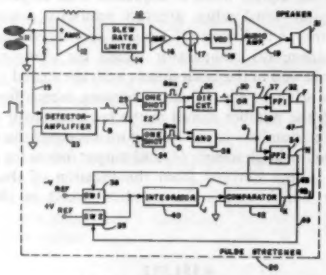
APPARATUS FOR SENSING AND TRANSMITTING A PACEMAKER'S STIMULATING PULSE

John D. Menken, St. Paul; Brian A. Brastad, Wayzata, and Thomas C. Barthel, Becker, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 6, 1975, Ser. No. 555,897

Int. Cl.[2] G08C *19/22*; A61B *5/04*

U.S. Cl. 340—206 **2 Claims**



1. Apparatus for providing and transmitting together stimulating pulses as applied by an artificial pacemaker to a patient's heart and an electrocardiac signal of the patient's heart over a limited bandwidth medium to a remote station, said apparatus comprising:

(a) modulation means for generating a carrier signal of a frequency to be transmitted over the limited bandwidth medium;

(b) means for providing a multiplied signal of a pulse width corresponding to the pulse width between the leading and trailing edges of the stimulating pulse multiplied by a fixed factor;

(c) means for superimposing and applying the multiplied signal and the electrocardiac signal together to said modulation means, whereby the superimposed signals are transmitted over the limited bandwidth medium, the fixed factor selected to be not less than 30 and not more than 50 to insure that data of the multiplied signal is accurately transmitted over the limited bandwidth medium at the carrier frequency and does not obscure the electrocardiac signal; and

(d) receiving apparatus for receiving the stimulating pulses as transmitted over the limited bandwidth medium and including display means for displaying an indication of the pulse width of the stimulating pulse, artifact detector means responsive to the transmitted signal for separating the stimulating pulse from other signals, means for detecting the leading and trailing edges of the separated stimulating pulse signal and for providing signals indicative thereof, clock means for providing clock pulses, and counter means responsive to the output of said detection means for counting the number of clock pulses occuring during the pulse width of the stimulating pulse to provide an output indicative thereof and display means responsive to the output of said counter means for providing display of the pulse width information.

4,151,514

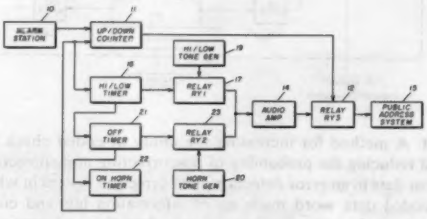
MANUALLY PROGRAMMABLE AUDIBLE ALARM SYSTEM

Ben R. Haynes, Houston, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,052

Int. Cl.[2] G08B *23/00*

U.S. Cl. 340—286 R **5 Claims**



1. An alarm system comprising:

(a) a manually operable switch,

(b) a counter for accumulating a count of the closures of said switch,

(c) a first timer that is turned ON in response to the first closure of said switch, said timer being ON for the duration of a preset time period,

(d) means for producing a first audible tone during the period of said first timer,

(e) a second timer that is turned ON in response to the termination of the time period of said first timer, said timer being ON for the duration of a preset time period during which no audible tone is sounded,

(f) a third timer that is turned ON in response to the termination of the time period of said second timer, said third timer being ON for the duration of a preset time period,

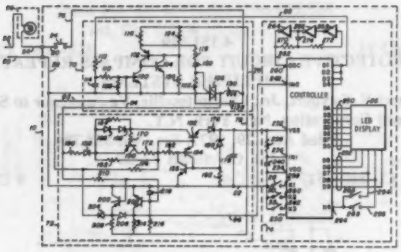
(g) means for producing a second audible tone during the period of said third timer, and

(h) means for reinitiating the successive time periods of said second and third timers until the cumulative total of second audible tones equals the count of switch closures accumulated in said counter.

4,151,515
LOAD CONTROL APPARATUS

Hugh R. Pease, Saratoga; Franklin J. Agardy, and Elliot Josephson, both of Los Altos, all of Calif., assignors to Hutec Corporation, San Jose, Calif.

Filed Nov. 11, 1977, Ser. No. 850,604
Int. Cl.[2] H01H *7/00, 43/00;* **H05B** *37/02*
U.S. Cl. 340—309.1 **13 Claims**



1. An improved load control apparatus for controlling the operation of a load in a predetermined manner using power derived from current flowing through the load comprising:

a first terminal for connection through the load to one of a pair of power conducting wires;

a second terminal for connection to the other of said power conducting wires;

a high impedance means connectable across said terminals to limit current flowing through said load to less than that required to operate said load in its intended manner;

a low impedance means connectable across said terminals to allow normal operating current to flow through said load;

switching means responsive to an actuating signal and operative to switch between a first state wherein said high impedance means is connected between said terminals and a second state wherein said switching means connects said low impedance means between said terminals;

power supply means for developing a DC potential irrespective of the state of said switching means, said power supply means including said high impedance means and operative to develop said DC potential in response to current flowing therethrough; and

actuating means powered by said DC potential, said actuating means being responsive to the occurrence of a first predetermined condition and operative to develop said actuating signal whereby said switching means is caused to switch to said first state and cause said load to become inoperative.

4,151,516
PCM CODER WITH SHIFTING IDLE CHANNEL NOISE LEVEL

John F. O'Neill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

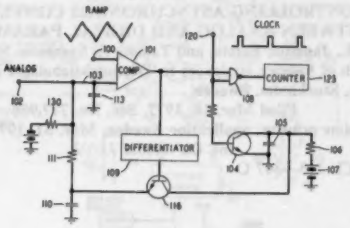
Filed Aug. 26, 1975, Ser. No. 607,778
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 CC **8 Claims**

1. In a PCM encoder for converting input analog signals into digital signals, said encoder including means for receiving timing pulses,

a. a digital counter for counting said timing pulses,

b. a comparator for comparing said input analog signals applied to a first input lead of said comparator with a cyclically varying reference signal applied to a second input lead of said comparator and for inhibiting said counter when said input analog and reference signals match,

c. means for accumulating a biasing voltage the magnitude of which is responsive to the period of time ending when said input analog and reference signals match and beginning with a predetermined timing pulse preceding said match, the accumulating means comprising circuitry for generating a sequence of voltage ramps, synchronized with said timing signals, and

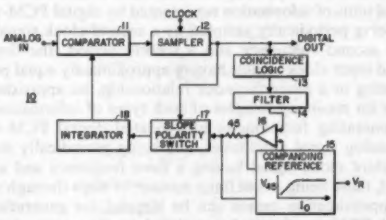


d. biasing means for applying said biasing voltage to one of said input leads of said comparator for adjusting the level of said biasing voltage to cause said input analog and reference signals to match at a point in time substantially midway between consecutive timing pulses.

4,151,517
CLOSED LOOP COMPANDING RATIO CONTROL FOR CONTINUOUSLY VARIABLE SLOPE DELTA MODULATION

Stephen H. Kelley, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1977, Ser. No. 768,117
Int. Cl.[2] H03K *13/22*
U.S. Cl. 340—347 C **14 Claims**



1. A continuously variable slope delta modulation circuit for encoding/decoding input signals, comprising: a comparator having a first input, a second input and an output, the first input being for receiving input information; a sampler having a first and a second input and an output, the first input being adapted for receiving clock pulses, and the second input being coupled to the output of the comparator; an integrator having an input and an output, the output being coupled to the second input of the comparator; a slope polarity switch having a first input, a second input, and an output, the output being coupled to the input of the integrator, the first input of the slope polarity switch being coupled to the output of the sampler; a level detect algorithm having an input and an output, the input being coupled to the output of the sampler; a first amplifier having a first input, a second input, and an output, the first and second inputs forming a differential input, the first input of the first amplifier being coupled to the output of the level detect algorithm; a companding ratio reference coupled to the second input of the first amplifier, the output of the first amplifier coupled to the second input of the slope polarity switch; and a second amplifier having a first input, a second input, and an output, the output being coupled to the second input of the first amplifier, the first and second inputs forming a differential input, the first input being coupled to the output of the level

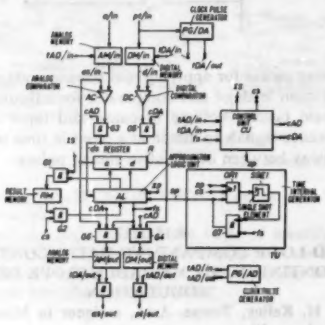
detect algorithm, and the second input being coupled to the output of the first amplifier.

4,151,518

CONTROLLING ASYNCHRONOUS CONVERSION BETWEEN ANALOG AND DIGITAL PARAMETERS

Erik L. Jansson, Farsta, and Tommy E. Svensson, Skärholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 16, 1977, Ser. No. 777,956
Claims priority, application Sweden, Mar. 31, 1976, 7603843
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 C **22 Claims**



1. In a codec having a first input means for receiving first units of information represented by analog signals and being periodically sampled by a first clock signal having a first frequency and a first period, a second input means for receiving second units of information represented by digital PCM-words and being periodically sampled by a second clock signal having a second frequency and a second period, the first and second input clock signals having approximately equal periods but being in a plesiochronous relationship, an approximation means for receiving samples of both types of information, and for generating functionally inter-related digital PCM-words and analog signal amplitudes, and being periodically stepped by a third clock signal having a third frequency and a third period, there being a first finite number of steps through which the approximation means can be stepped for generating the digital PCM-word which is related to the received analog signal sample, and a second finite number of steps through which the approximation means can be stepped for generating the analog signal amplitude which is related to the received digital PCM-word sample, a first output means adapted to transmit analog signals, and a second output means adapted to transmit digital PCM-words, the method of controlling the codec to perform conversions of a first type resulting in that an analog signal is converted to a digital PCM-word and also conversions of a second type resulting in that a digital PCM-word is converted to an analog signal with the approximation means at least partly being common to both conversion types, said method comprising the steps of

selecting the third periods such that the time required to perform the first number of finite steps as well as the second number of finite steps is shorter than one of said first and second periods,

initiating conversions of the first type in response to said first clock signals sampling the first information received by the first input means,

initiating conversions of the second type in response to said second clock signals sampling the second information received by the second input means,

stepping the approximation means with said third clock signals in response to received first information samples, in order to perform conversions of the first type,

stepping the approximation means with said third clock signals in response to received second information samples, in order to perform conversions of the second type,

transferring the results of such conversions of the first type to the second output means,

transferring the results of such conversions of the second type to the first output means, and

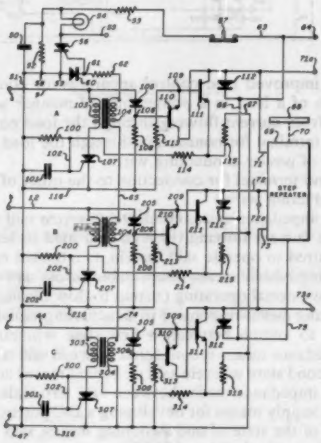
insuring that only one of said conversions can occur at any one time.

4,151,519

PROTECTIVE CIRCUIT FOR COMPASS REPEATER AMPLIFIER SYSTEMS

Wilbert E. Swygert, Jr., Charlottesville, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,794
Int. Cl.[2] G08B *23/00*
U.S. Cl. 340—517 **9 Claims**



1. In a step-by-step angle data repeater system including transmitter means having plural output means providing phase-displaced multiple-wire step data voltages indicative of angle, cooperating step-by-step receiver means for repeating said angle and having corresponding plural input means, and plural data processing channels for coupling said respective plural output means to corresponding ones of said plural input means, the improvement wherein each said data processing channel comprises:

trigger circuit means responsive to the presence of a high or a low output voltage level at a first of said plural output means,

first diode means coupled in series with the output of said trigger circuit means,

amplifier means coupled to said first diode means for supplying corresponding high or low excitation currents to a first of said plural output means and having current return means in common with said trigger circuit means,

impedance means,

second diode means having a gate control electrode,

said impedance means and said second diode means being coupled in series relation between said first of said input means and said current return means,

sensor impedance means sensing the amplitude of said excitation current for developing a corresponding sensor voltage thereacross, and

network means coupling said sensor voltage to said gate control electrode whereby, only in the presence of said high excitation current and of a fault event causing said sensor voltage to increase above a predetermined level, said second diode latches in its conducting state, latching

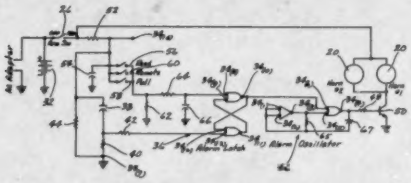
said amplifier means in its non-conducting state and protecting said amplifier means from destruction because of said fault event.

4,151,520

PORTABLE SELF-CONTAINED ALARM WITH REMOTE TRIGGERING CAPABILITY

Elliott D. Full, 1820 Rochester, Iowa City, Iowa 52240

Filed Jul. 25, 1977, Ser. No. 818,588
Int. Cl.[2] G08B *13/08, 15/00*
U.S. Cl. 340—528 **11 Claims**



1. A portable alarm device comprising,
a portable housing,
a battery means within said housing,
an audio alarm within said housing, and
an electronic circuit means within said housing connecting said battery means to said alarm, said electronic circuit means comprising an oscillator circuit means to drive said alarm, a latching circuit means to hold said oscillator circuit means in an operating mode after activation, said oscillator circuit means being electrically connected to said latching circuit means and said alarm, a first triggering switch means to activate said oscillator circuit means and said alarm, and a second switch means electrically connected to positions with said first triggering switch means being electrically connected to said latching circuit means and said second switch means,
said first position of said second switch means being a closed position to place said electronic circuit means in a ready, armed mode so that activation of said triggering switch means activates said oscillator circuit means and said alarm, said latching circuit means being disabled for a predetermined time period after said second switch means assumes said first position so that activation of said triggering switch means during said predetermined time period momentarily activates said oscillator circuit means and said alarm in an unlatched condition and the activation of said triggering switch means subsequent to said predetermined time period activates said latching circuit means, said oscillator circuit means and said alarm in a latched condition,
said second position of said second switch means being an open position to place said electronic circuit means in an off, unarmed mode.

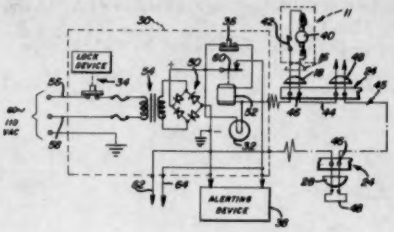
4,151,521

POWER TOOL THEFT ALARM

John C. Wirth, Jr., 620 LaJolla, NE., Albuquerque, N. Mex. 87123

Filed Sep. 15, 1977, Ser. No. 833,809
Int. Cl.[2] G08B *13/00*
U.S. Cl. 340—568 **10 Claims**

1. In combination with a plurality of electrical appliances, each enclosing an electrical load adapted to be connected to a power source through a power cord and a plug upon closing of a power switch for operation of the applicance, an anti-theft system for protecting the appliances disconnected from the power source, comprising: means for holding the power switches closed, connector means engageable with the plugs for electrically connecting all of the electrical loads and the power switches in series, a power operated alerting device, and sensing means connected to the connector means for activating the alerting device in response to opening of any of the power



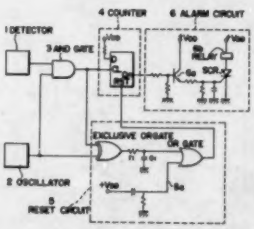
switches or withdrawal of any of the plugs from engagement with the connector means.

4,151,522

COUNT DISCRIMINATING FIRE DETECTION SYSTEM

Yukio Yamauchi, Kawasaki, Japan, assignor to Hochiki Corporation, Japan

Filed Jun. 15, 1977, Ser. No. 806,881
Claims priority, application Japan, Jun. 17, 1976, 51-70410
Int. Cl.[2] G08B *17/00*
U.S. Cl. 340—587 **5 Claims**

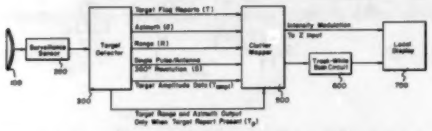


1. A count discriminating fire detection system comprising, in combination;
an oscillator circuit for generating oscillating pulses at a predetermined frequency;
a fire detection means connected to said oscillator circuit for detecting a change of more than a predetermined amount in a physical parameter indicative of a fire for producing detection pulses synchronous with said oscillating pulses;
a counting means having an input terminal connected to said fire detection means and a reset terminal, for counting said detection pulses for producing an output upon counting a predetermined number said detection pulses and for resetting said counting upon application of a signal to said reset terminal;
a reset means having a first input terminal connected to said fire detection means, a second input terminal connected to said oscillator circuit and an output terminal connected to said reset terminal of said counting means, for applying a signal to said reset terminal of said counting means upon receiving an oscillator pulse without receiving a detection pulse; and
an alarm circuit connected to said counting means for producing a fire alarm when said counting means produces an output.

4,151,523
CLUTTER MAPPER LOGIC SYSTEM

Vernon H. Platt, Fullerton, and Richard D. Wilmot, Buena Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 25, 1976, Ser. No. 717,711
Int. Cl.[2] G01S 7/44
U.S. Cl. 343—5 DP 12 Claims

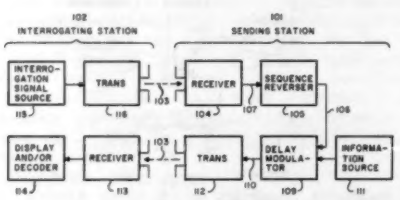


1. In an energy sensing system, the combination comprising:
a time-between-detection-logic circuit;
a digital memory circuit electrically connected to the output of the logic circuit;
an amplitude comparator circuit the input of which is electrically connected to the output of the digital memory circuit; and
a track-while-scan circuit the input of which is electrically connected to the output of the amplitude comparator.

4,151,524
MULTIPATH COMMUNICATIONS SYSTEM

William J. Caputi, Jr., Northport, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 24, 1964, Ser. No. 421,755
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R 3 Claims



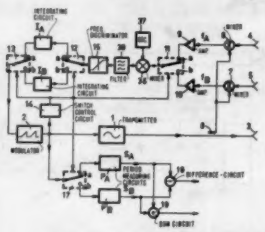
3. The method of modulating a dispersed pulse signal by a temporally sequential series of intelligence elements, comprising the steps of:
(a) producing a series of component signals each substantially identical with said dispersed pulse signal but delayed with respect thereto by an amount corresponding to the time position of a respective intelligence element, and
(b) modifying a characteristic of each of said component signals in accordance with the value of a similar characteristic of the respective intelligence element.

4,151,525
RADIO-ELECTRIC SYSTEM FOR LOCATING A GIVEN OBJECT

Raymond Strauch, Viroflay, and Jean-Pierre Tomasi, Velizy, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 28, 1977, Ser. No. 810,668
Claims priority, application France, Jul. 1, 1976, 76 20091
Int. Cl.[2] G01S 9/52, 9/58
U.S. Cl. 343—6.5 R 13 Claims

1. A radio locating system comprising an interrogator having means for transmitting a radio signal to a transponder, said transmitting means including means for modulating said radio signal with a modulation signal having a linearly varying frequency, said transponder including means for receiving said radio signal, means for forming from the received signal, a signal having a component with the same modulation slope as that of the received signal and a frequency shifted in one direction by a predetermined amount characteristic of that transponder, and means for transmitting the signal having said frequency shifted component to said interrogator, said interrogator further including at least two spaced antennas for receiving said signal with said frequency shifted component, means, coupled to said antennas, for deriving a beat signal from the signal received by each antenna and the signal transmitted by

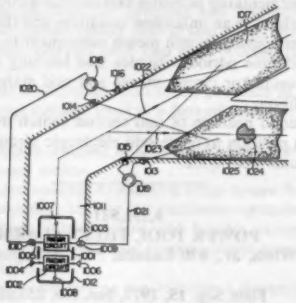


said interrogator transmitting means, means for shifting the frequency of at least one of said beat signals by said predetermined amount in a direction opposite to said one direction, a frequency discriminator having an output and an input coupled to said frequency shifting means, means for coupling the signal at said output of said discriminator to said modulating means to control the slope of said modulation signal so that the frequency of said frequency-shifted component is constant, and means for deriving from said beat signals data regarding the bearing of said transponder relative to said interrogator.

4,151,526
OBSTACLE DETECTING RADAR APPARATUS FOR A MOTOR VEHICLE OR THE LIKE

Matatoyo Hinachi, Nagoya, and Kiyoshi Miki, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 9, 1977, Ser. No. 805,143
Claims priority, application Japan, Jul. 8, 1976, 51-81213
Int. Cl.[2] G01S 9/04
U.S. Cl. 343—7 VM 6 Claims



1. An obstacle detecting system for motor vehicles comprising:
first antenna means, located on a vehicle running road, for receiving and radiating an electromagnetic wave;
second antenna means, located on said vehicle running road and spaced apart from said first antenna means, for receiving and radiating said electromagnetic wave;
transmission line means, provided to connect said first and second antenna means and disposed having at least a

portion thereof embedded in said vehicle running road for transmitting said electromagnetic wave therethrough;

a reflector, coupled to said transmission line means at a predetermined distance spaced from said first antenna means, for reflecting some part of said electromagnetic wave transmitted from said first antenna means to said second antenna means;

radar circuit means, carried by the motor vehicle, for radiating said electromagnetic wave which is received by said first antenna means and radiated by said second antenna means into a space and receiving said electromagnetic wave which is reflected by an obstacle in said space, received by said second antenna means and radiated by said first antenna means, whereby said radar circuit means detect said obstacle upon receipt of said electromagnetic wave reflected by said obstacle; and

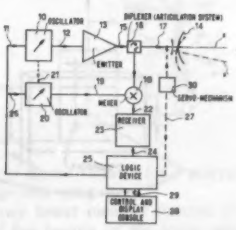
time measuring means, connected to said radar circuit means, for measuring the time interval between the radiation of said electromagnetic wave from said radar circuit means and the receipt of said electromagnetic wave reflected by said reflector.

4,151,527

PROCESS AND APPARATUS FOR THE DETECTION OF OBJECTS, ESPECIALLY OF OBJECTS HAVING A VERY SMALL EQUIVALENT SURFACE AREA

Leon Masliah, Vaucresson, and Jean F. Morand, Paris, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Mar. 11, 1977, Ser. No. 776,543
Claims priority, application France, Mar. 12, 1976, 76 07215
Int. Cl.[2] G01S 9/24
U.S. Cl. 343—7.5 **5 Claims**



3. An apparatus for the detection of objects, comprising:

a variable frequency transmitter means;

an antenna means having a controllable orientation coupled to said transmitter means for emitting beams of electromagnetic radiation and for detecting signals reflected from an object, means for controlling the orientation of said antenna means;

receiver means coupled to said antenna means for comparing the amplitude of the reflected signals with a preselected threshold value and for delivering an output signal when the amplitude of the reflected signal is greater than said threshold value; and

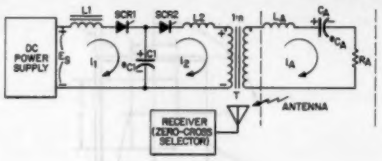
logic means connected to said receiver means for varying said frequency in steps over a finite set of frequency values, said logic means being coupled to said means which controls the orientation of the antenna for modifying said orientation when said output signal is produced at the receiver means or at the end of the finite set of frequency values.

4,151,528

METHOD OF AND APPARATUS FOR UNAMBIGUOUS RADIO NAVIGATION

Paul R. Johannessen, Lexington, Mass., assignor to Megapulse, Incorporated, Bedford, Mass.

Filed Apr. 7, 1977, Ser. No. 785,367
Int. Cl.[2] G01S 1/24; H03K 3/02
U.S. Cl. 343—103 **21 Claims**



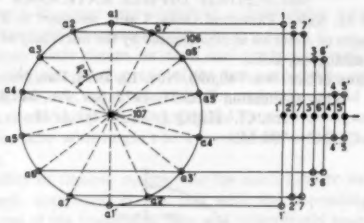
11. A method of Loran radio navigation and the like, that comprises, generating a navigation pulse comprising a single cycle of radio-frequency energy of unique sum amplitude and zero-crossing slope value and transmitting the pulse, receiving the pulse transmission, and selecting the zero crossing of the single cycle for timing information.

4,151,529

RADIO BEACON FOR AERIAL NAVIGATION SYSTEM

Jacques A. Dorey, Combs-la-Ville, France, assignor to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Filed Jul. 5, 1977, Ser. No. 812,733
Claims priority, application France, Jul. 9, 1976, 76 21155
Int. Cl.[2] G01S 1/44
U.S. Cl. 343—106 D **7 Claims**



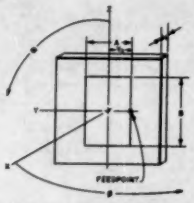
1. In an aerial navigation system wherein a ground station has a beacon for sending out radio waves to be received aboard an aircraft equipped with a processor for signals having the character of waves emitted by a rotating source,

the improvement wherein said beacon comprises a multiplicity of stationary radiator pairs, the radiators of said pairs being interconnected by imaginary lines all parallel to a predetermined direction, and supply means for energizing said radiator pairs in cyclic succession, the lengths of said imaginary lines varying as a sinusoidal function of the time of energization of the respective radiator pairs.

4,151,530
END FED TWIN ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,690, Nov. 10, 1976, Pat. No. 4,072,954.
This application Oct. 31, 1977, Ser. No. 847,454
Int. Cl.[2] H01Q *1/38, 21/00, 1/48*
U.S. Cl. 343—700 MS **22 Claims**

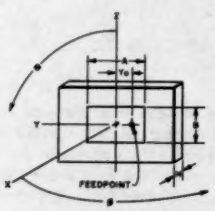


1. An end fed twin electric microstrip dipole antenna structure, comprising:
   a. a dielectric substrate;
   b. a twin pair of thin rectangular radiating elements disposed one each on opposite sides of said dielectric substrate which electrically separates the twin radiating elements;
   c. the radiating element on one side of said dielectric substrate being directly opposite to and the mirror image of the radiating element on the other side of said dielectric substrate;
   d. each of said twin radiating elements being operable to be excited to radiate in a microstrip mode, and each of said twin radiating elements acting as a ground plane for the other;
   e. the broadside fields of each of the twin radiating elements being excited in identical modes of oscillation, radiating independently of each other with respective fields on opposite sides of the dielectric substrate being 180 degrees out of phase with one another;
   f. said twin radiating elements each having a feed point located at an end of the length of the centerline thereof; said feed points being directly opposite to one another;
   g. the length of said twin radiating elements determining the resonant frequency of the antenna.

4,151,531
ASYMMETRICALLY FED TWIN ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,690, Nov. 10, 1976, Pat. No. 4,072,954.
This application Oct. 31, 1977, Ser. No. 847,455
Int. Cl.[2] H01Q *1/38, 21/00, 1/48*
U.S. Cl. 343—700 MS **22 Claims**

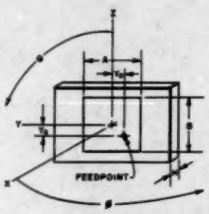


12. A twin electric microstrip dipole antenna structure, comprising:
   a. a dielectric substrate;
   b. a twin pair of thin radiating elements disposed one each on opposite sides of said dielectric substrate which operates to electrically separate the two radiating elements;
   c. the radiating element on one side of said dielectric substrate being directly opposite to and the mirror image of the radiating element on the other side of said dielectric substrate;
   d. each of said twin radiating elements being operable to be excited to radiate in a microstrip mode, and each of said twin radiating elements acting as a ground plane for the other;
   e. the broadside fields of each of the antenna radiating elements being excited in identical modes of oscillation, radiating independently of each other with respective fields on opposite sides of the dielectric substrate being 180 degrees out of phase with one another;
   f. each of said twin radiating elements being asymmetrically fed, at a feed point located on the radiating elements; said feed points being directly opposite to each other;
   g. the length of said twin radiating elements determining the resonant frequency of the antenna;
   h. the input impedance of said antenna being variable to match most practical impedances as said feed points are moved on the radiating elements;
   i. the antenna bandwidth being variable with the width of the radiating elements and the spacing between said twin radiating elements, the spacing between the twin radiating elements having somewhat greater effect on the bandwidth than the radiating element width.

4,151,532
DIAGONALLY FED TWIN ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,690, Nov. 10, 1976, Pat. No. 4,072,954.
This application Oct. 31, 1977, Ser. No. 847,457
Int. Cl.[2] H01Q *1/38, 21/00, 1/48*
U.S. Cl. 343—700 MS **23 Claims**



1. A diagonally fed twin electric microstrip antenna comprising:
   a. a dielectric substrate;
   b. a twin pair of thin rectangular radiating elements disposed one each on opposite sides of said dielectric substrate which electrically separates the twin radiating elements;
   c. the radiating element on one side of said dielectric substrate being directly opposite to and the mirror image of the radiating element on the other side of said dielectric substrate;
   d. each of said twin radiating elements being operable to be excited to radiate, and each of said twin radiating elements acting as a ground plane for the other;
   e. the broadside fields of each of the twin radiating elements being excited in identical modes of oscillation, radiating independently of each other with respective fields on opposite sides of the dielectric substrate being 180 degrees out of phase with one another;
   f. said twin radiating elements each having a single feed point located along a diagonal line of the radiating ele-

ments between the outer edge and center point thereof; said feed points being directly opposite to each other;

g. the length of the radiating elements determining the resonant frequency of said antenna;

h. the antenna input impedances being variable to match most practical impedances as said feed points are moved along said diagonal line;

i. the antenna bandwidth being variable with the width of the radiating elements and the spacing between said twin radiating elements, the spacing between the twin radiating elements having somewhat greater effect on the bandwidth than the radiating element width;

j. said radiating elements each being operable to oscillate in two modes of current oscillation, said two modes being orthogonal to each other with mutual coupling being minimal, the properties of each mode of oscillation being determined independently of one another; the parallel combination of the input impedance of each mode for both radiating elements providing a combined antenna input impedance;

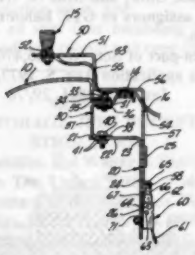
k. antenna polarization being linear when the radiating elements length and width are equal, the antenna polarization being circular when the phase difference between the two modes of oscillation are in quadrature due to differences between the length and width of the radiating elements.

4,151,533

ANTENNA MOUNT

Russell A. Vogt, 6091 Cochise, West Bloomfield Hills, Mich. 48033

Filed Sep. 1, 1977, Ser. No. 829,772
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **4 Claims**



1. A transceiver mount suitable for a conveyance having a coverable storage area comprising

(A) a hold-down lower member formed of a substantially right-angled bar having on the lower end of its vertical arm vertically-adjustable, lever-operated tension fastener means for engaging a fixed reciprocal element on a contiguous vertical arm of another bar, having on the upper end of said vertical arm a pair of laterally positioned upright claws for slidably receiving said contiguous vertical arm and having on its horizontal arm a pair of slots for engaging post-bolt means

(B) a clamping intermediate member formed of a substantially U-shaped bar whose upper arm has water-proofed bolting means for attachment to the under side of a lateral runoff trough adjacent to the rear coverable storage area of a conveyance and whose lower arm has post-bolt means for horizontally adjusting and bolting the horizontal arm of said hold-down lower member (A) and

(C) an antenna-holding upper member formed of a double substantially right-angled bracket bar having

(a) on its lower vertical arm fixed catching means for engaging a grasping element of the tension fastener means on the vertical arm of the hold-down member (A),

(b) a substantially centrally positioned slot extending from the top of a lower vertical arm through a lower horizontal arm and an upper vertical arm and terminating at an inside end of an upper horizontal arm,

(c) at least one opening in an upper horizontal arm for attachment of a transceiver antenna, and

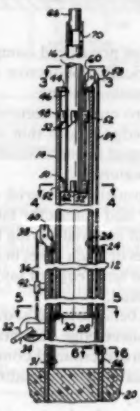
(d) one smaller opening in said upper horizontal arm for receiving a ground of co-ax cable element of said antenna.

4,151,534

ANTENNA TELESCOPING TOWER

Orville R. Bond, P.O. Box 3412, Enid, Okla. 73701

Filed Sep. 14, 1977, Ser. No. 833,219
Int. Cl.[2] H01Q *1/10*
U.S. Cl. 343—883 **6 Claims**



1. An antenna supporting tower, comprising:

a plurality of vertically disposed telescoping tubes of consecutive progressively reduced transverse dimension in an upward direction and including a lowermost tube end portion rigidly secured to the earth;

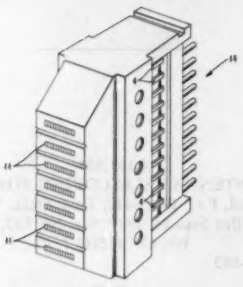
individual guide means on each end portion of said tubes except the depending end of the lowermost tube and the top end of the uppermost tube for maintaining said tubes concentric and preventing angular rotation or separation of one tube with respect to a surrounded or surrounding tube;

a plurality of flexible means, one for each tube to be telescoped, connected at one end with the depending end portion of the lowermost tube and respectively extending over pulleys respectively mounted on the upper end of said tubes except the uppermost end of the upper tube and connected at its other end with the depending end of said tubes to be telescoped, respectively, for simultaneously telescopically extending or retracting said tubes; and upper and lower stabilizing means surrounding the depending end portion of said upper tube within said intermediate tube, said stabilizing means each comprising a plurality of vertically disposed right circular cylindrical rods disposed in circumferentially equally spaced vertically aligned relation, at least two of said vertically aligned rods having an axial aperture for receiving said flexible element.

4,151,535
ELECTRO-EROSION HEAD AND MANUFACTURING METHOD

Edward C. Uberbacher, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,133
Int. Cl.[2] G01D *15/08*
U.S. Cl. 346—139 C 9 Claims

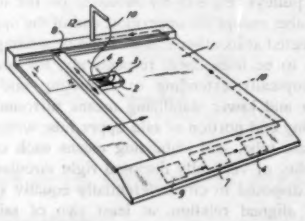


1. An electro-erosion print head comprising;
a plurality of electrically conductive thin sheets of material having a predetermined shape;
a plurality of electro-erosion electrodes formed in and extending from an edge of said thin sheet of material;
a connector tab formed in and extending from another edge of said sheet of material;
a thin coating of insulating material covering each of said sheets except for said connector tabs;
each of said sheets of material having holes therein for stacking, the electrodes on each sheet being located at the same location along the same edge of said sheets so as to form a multi-electrode head;
said connector tabs being located at different positions along said respective sheet edge to obtain the predetermined spacing for the predetermined connector fanout;
an encapsulating material surrounding said sheets thereby forming an unitary structure;
the ends of said electrodes having said encapsulating material removed so as to provide high density electrical discharge paths therefrom through which said electro-erosion printing function can be performed.

4,151,536
DEVICE FOR INSCRIBING GRAPHIC AND ALPHANUMERICAL SYMBOLS ON A RECORDING MEDIUM

Jacques Valin, Paris, France, assignor to Compagnie d'Informatique Militaire, Spatiale et Aeronautique, Paris, France

Filed Jul. 26, 1977, Ser. No. 819,144
Claims priority, application France, Jul. 27, 1976, 76 22836
Int. Cl.[2] G03G *17/00*
U.S. Cl. 346—162 10 Claims

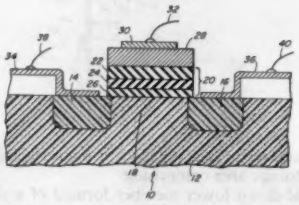


1. A device for the inscription of graphic and alphanumerical symbols, comprising:
a recording medium adapted to be marked by the localized application of electric energy thereto;
support means forming a guidetrack extending in a first direction across said recording medium, said support means being displaceable in a second direction transverse to said first direction;
a writing head movably carried on said support means for displacement along said guidetrack in said first direction, said writing head being provided with a multiplicity of parallel electrodes closely juxtaposed with said recording medium and equispaced in a linear array extending in said second direction over a fraction of the dimension of said recording medium transverse to said guidetrack;
drive means for moving said array across said recording medium by displacing said writing head along said guidetrack in said first direction and said support means transversely thereto in said second direction;
a pulse generator synchronized with said drive means and adapted to energize any of said electrodes for producing a visible mark at a corresponding location of said recording medium;
switching means inserted between said pulse generator and said electrodes; and
control means for operating said switching means in timed relationship with the displacement of said writing head by said drive means for selectively energizing said electrodes to form a predetermined pattern of marks on said recording medium.

4,151,537
GATE ELECTRODE FOR MNOS SEMICONDUCTOR MEMORY DEVICE

Ernest A. Goldman, Stow, and Moe S. Wasserman, Sherborn, both of Mass., assignors to GTE Laboratories Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 665,470, Mar. 10, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,010
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 12 Claims

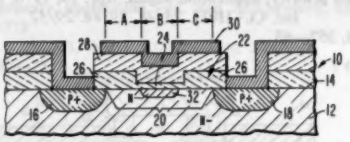


1. In a semiconductor memory device including a substrate made of a semiconductive material of a first conductivity type, a source and a drain made of a semiconductive material of a second conductivity type and being non-contiguously disposed in surface regions of said substrate so that the substrate surface region between said source and drain defines a channel, a gate insulator covering said channel and at least a portion of said source and drain adjacent to said channel, said gate insulator including a plurality of layers of dielectric material, and a gate electrode covering said gate insulator, an improvement comprising
a dielectric region within said gate insulator having a density of trapping states of about 2×10^{12} states per square centimeter and being separated from said channel by a tunneling-conducive distance; and
said gate electrode being made of a conductive material having a work function greater than that of aluminum and capable of adequately adhering to said gate insulator for minimizing electron injection from said gate electrode into the material of said gate insulator during the application of high voltage pulses between said gate electrode and said substrate.

4,151,538
NONVOLATILE SEMICONDUCTIVE MEMORY DEVICE AND METHOD OF ITS MANUFACTURE

Murray A. Polinsky, Somerville, and William N. Lewis, Bridgewater, both of N.J., assignors to RCA Corp., New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,713
Int. Cl.[2] H01L 29/78
U.S. Cl. 357—23 10 Claims



1. An improved nonvolatile semiconductive memory device formed in a body of semiconductive material of one type conductivity having a surface with spaced source and drain regions of opposite type conductivity in said body adjacent to said surface and defining the ends of a channel region of controllable conductivity, a first insulating layer on said surface over said channel region, said first insulating layer having a thin, charge tunnelling portion over part of said channel region and a thick non-tunnellng portion over the rest of the said channel region, a second insulating layer on said first insulating layer, and a gate electrode layer on said second insulating layer, wherein the improvement comrises:

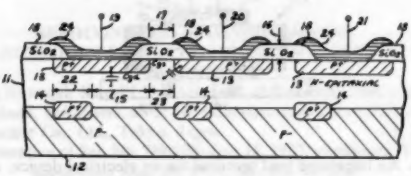
at least a portion of said channel region beneath said thin portion of said first insulating layer having a concentration of conductivity modifiers of said one type greater than the concentration of conductivity modifiers in the portion of said channel region beneath said thick portion of said first insulating layer, and

said thin portion of said first insulating layer containing conductivity modifiers of said one type embedded therein.

4,151,539
JUNCTION-STORAGE JFET BUCKET-BRIGADE STRUCTURE

Mark B. Barron, Camillus, and Walter J. Butler, Scotia, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1977, Ser. No. 864,065
Int. Cl.[2] H01L 29/78, 29/80; G11C 19/28
U.S. Cl. 357—24 1 Claim



1. An integrated solid state junction-storage device comprising a plurality of junction field effect transistors forming a bucket-brigade structure comprising:

a. a p^- type substrate having a surface;

b. an n-type epitaxial layer formed on the said p^- type substrate adjacent the said surface;

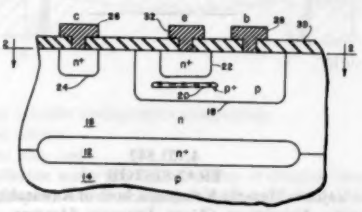
c. a plurality of spaced apart p^+ type top gates of determined length having a first side and a second side, diffused into the said epitaxial layer; and

d. a plurality of spaced apart p^+ type buried gates, having a determined length that is shorter than the said determined length of the said top gates and having a first side and a second side, formed in the surface of the said substrate adjacent the said epitaxial layer with the said first side of each of the said buried gates substantially aligned with the said first side of a respective top gate whereby a channel region is provided in the said epitaxial layer between each buried gate and its respective top gate, a source region is provided in the epitaxial layer between adjacent said top gates, and a drain region is provided in the said epitaxial layer between the said channel regions and the said source regions, in which the capacitances between the said top gates and the said drain regions is greater than the capacitances between the said top gates and the said source regions providing for bucket-brigade directionality.

4,151,540
HIGH BETA, HIGH FREQUENCY TRANSISTOR STRUCTURE

Wendell B. Sander, San Jose, and William H. Shepherd, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 8, 1977, Ser. No. 858,572
Int. Cl.[2] H01L 29/72
U.S. Cl. 357—34 5 Claims



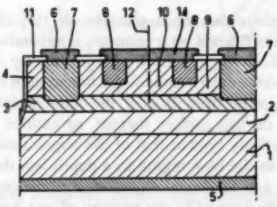
1. In a transistor having an emitter and a collector of a first conductivity type of semiconductor material separated by a high resistivity base structure of a second conductivity type of semiconductor material, the improvement comprising:

an electrostatic shield formed by a heavily doped region of second conductivity type of semiconductor material in said high resistivity base structure in the region of the base-emitter junction for inhibiting punch-through breakdown between collector and emitter of said transistor.

4,151,541
POWER TRANSISTOR

Bernard Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,601
Claims priority, application France, Dec. 20, 1976, 76 38304
Int. Cl.[2] H01L 29/721
U.S. Cl. 357—34 5 Claims



1. A bipolar transistor which comprises:

a first semiconductor layer of a first type conductivity which forms at least a part of the collector zone of said transistor;

a second semiconductor layer of a second type conductivity opposite to that of the first which adjoins said first layer and forms the base zone of said transistor;

a third surface-adjoining semiconductor layer of said first

conductivity type which adjoins said second layer and forms a part of the emitter zone of said transistor;

a surface-adjoining region of said first type conductivity in said third layer and having a higher impurity doping level than that of said third layer, said surface-adjoining region extending only partially through said third layer and laterally surrounding a central portion thereof;

a surface-adjoining base contact zone of said second type conductivity which surrounds said third layer and connects said base zone to the surface of said transistor, said surface-adjoining region being laterally spaced apart from said base contact zone; and

a surface-adjoining conductive electrode for contacting said emitter zone, said electrode being connected to both the surface-adjoining region and the central portion of said third layer.

4,151,542

TRANSISTOR

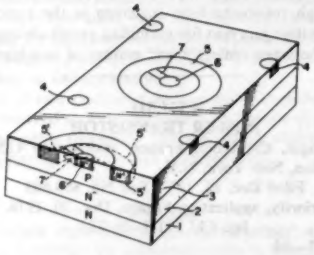
Kazuo Yajima; Masaaki Kobayashi, both of Kawasaki; Yoshiaki Nawata, Yokohama; Shigeo Iwasawa, Hayama, and Koji Takahashi, Kamakura, all of Japan, assignors to Fujitsu Limited, Japan

Filed Feb. 7, 1978, Ser. No. 875,917

Claims priority, application Japan, Feb. 7, 1977, 52-12678

Int. Cl.[2] H01L *29/72*

U.S. Cl. 357—36 **2 Claims**



1. A transistor having a plurality of ring-shaped emitter transistor units formed on a common semiconductor substrate of one conductivity type, each of said plurality of ring-shaped emitter transistor units comprising a base region of the opposite conductivity type from that of the semiconductor substrate and formed on one surface thereof, an emitter region of the same conductivity type as that of the semiconductor substrate and formed in the base region to a depth less than that of the base region and having a ring-shaped plane configuration, a base electrode formed in the vicinity of one periphery of the ring-shaped emitter region, an emitter electrode formed in the vicinity of the other periphery of the ring-shaped emitter region, and a ballasting resistor formed to interconnect the emitter electrode and the emitter region wherein the product of the area of the emitter region and the resistance value of the ballasting resistor of each ring-shaped emitter transistor unit is selected to be in the range of from 6.0×10^{-4} to 1.3×10^{-3} [Ω-cm^2].

4,151,543

LEAD ELECTRODE STRUCTURE FOR A SEMICONDUCTOR CHIP CARRIED ON A FLEXIBLE CARRIER

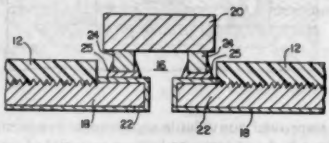
Masao Hayakawa, Kyoto; Takamichi Maeda, and Masao Kumura, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1977, Ser. No. 786,841

Claims priority, application Japan, Apr. 13, 1976, 51/42232

Int. Cl.[2] H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—65 **8 Claims**



1. A semiconductor device comprising:

an insulating substrate;

an aperture formed in the insulating substrate;

wiring patterns formed on the insulating substrate;

finger lead electrodes extending toward said aperture and electrically connected to said wiring patterns, the surfaces of the finger lead electrodes being smooth as compared to the surfaces of said wiring patterns; and

a semiconductor chip secured within said aperture and electrically connected to said smooth surfaces of said finger lead electrodes.

4,151,544

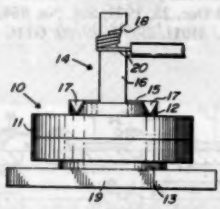
LEAD TERMINAL FOR BUTTON DIODE

James A. Riff, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1977, Ser. No. 864,988

Int. Cl.[2] H01L *23/48, 29/40, 29/44*

U.S. Cl. 357—65 **16 Claims**



1. An improved lead terminal for an electrical device, comprising:

a metallic flat plate portion generally defining a horizontal plane;

a first metallic projection connected to said flat plate portion and extending substantially away from said horizontal plane in a generally upward direction with respect to said plane; and

a plurality of second projections connected to said flat plate portion and extending away from said horizontal plane in generally downward directions with respect to said plane, whereby said first projection provides a suitable location for attaching a wire lead to said terminal while said plurality of downward projections aid in locating said lead terminal in a predetermined position with respect to an electrical device.

4,151,545

SEMICONDUCTOR ELECTRIC CIRCUIT DEVICE WITH PLURAL-LAYER ALUMINUM BASE METALLIZATION

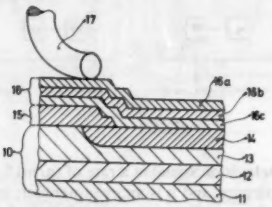
Dietmar Schnepf, Esslingen; Klaus Reindl, Pfullingen; Heiko Gruner, Gerlingen, and Friedrich Vogel, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,709

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649773

Int. Cl.[2] H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 7 Claims



1. A semiconductor electric circuit device having a monocrystalline silicon wafer body having zones of different conductivity and/or conductivitity type in various surface areas of said body for provision of components of said circuit device and being partly covered by an insulating layer which leaves uncovered, by windows therein, areas of said body or zones thereof for contact therewith, said body being also partly covered, above said insulating layer where the latter also covers the body, with a patterned metallization layer providing circuit paths, contact with said body or zones thereof through said windows, and areas for external contact application, and further including in order to prevent the occurrence of short-circuiting slivers at bonds with aluminum wires, the improvement, in accordance with the invention, that:

said metallization layer is composed of at least three distinct layers, comprising:

an outer layer (16*a*) of highly pure aluminum,

an underlying layer (16*b*) of copper-containing aluminum having a copper content of between 1 and 4% by weight, and

an inner layer (16*c*) of aluminum underlying said first-mentioned underlying layer (16*b*), said aluminum layer having a content by weight, from 0 to 1%, inclusive, of silicon.

4,151,546

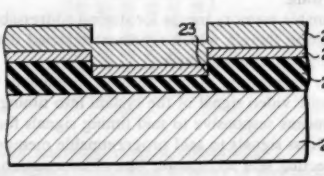
SEMICONDUCTOR DEVICE HAVING ELECTRODE-LEAD LAYER UNITS OF DIFFERING THICKNESSES

Kenji Kawagai; Shigeki Yoshida, both of Kawasaki, and Yasuo Nakada, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 759,135, Jan. 13, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,569

Int. Cl.[2] H01L *23/48, 29/46, 29/54*

U.S. Cl. 357—71 5 Claims



1. In a semiconductor device comprising a semiconductor substrate having semiconductor regions, an insulation layer, and electrode-lead layer units including electrode portions, lead pad portions and lead layer portions between and interconnecting said electrode portions and said lead pad portions;

the improvement wherein at least one portion of at least one electrode-lead layer unit comprises a first conductive layer and a second conductive layer directly laminated on the whole outer surface of said first conductive layer.

4,151,547

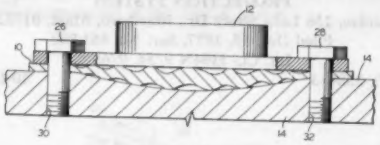
ARRANGEMENT FOR HEAT TRANSFER BETWEEN A HEAT SOURCE AND A HEAT SINK

John M. Rhoades, Waynesboro, and Patrick J. Montanino, Charlottesville, both of Va., assignors to General Electric Company, New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,211

Int. Cl.[2] H01L *23/02, 23/42, 23/44*

U.S. Cl. 357—81 12 Claims



1. A heat transfer arrangement comprising:

(a) a heat source;

(b) a heat sink; and

(c) a malleable wafer having a plurality of dimples thereon, said dimpled wafer being deformed between said heat source and said heat sink during emplacement therebetween for providing increased direct contacting of the adjacent heat sink and heat source surfaces, whereby to improve the thermal conductivity therebetween.

4,151,548

COOLING CONTAINER FOR COOLING A SEMICONDUCTOR ELEMENT

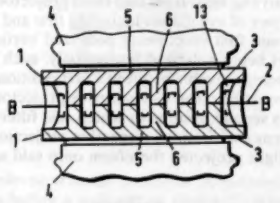
Erwin Klein, Heddesheim; Arno Henke, Gorxheimertal, and Hans Zink, Heddesheim, all of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Mannheim, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 831,006

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2640000

Int. Cl.[2] H01L *25/04, 23/16, 23/32*

U.S. Cl. 357—82 7 Claims



1. In a cooling container for cooling a semiconductor element exhibiting main external surfaces, wherein said main surfaces of said semiconductor element are maintained in contact with said cooling container by means of a pressure contact, said container formed of at least two parts which define a flow path therebetween through which flows a cooling liquid, preferably oil, the improvement comprising:

said two container parts comprising identical complementary halves, each having a bottom portion and a rim, said rims having formed therein diametrically opposed inlet

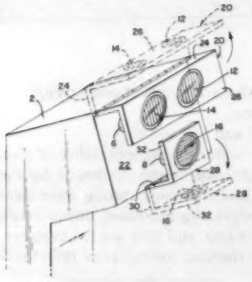
and outlet openings by which said liquid passes through said cooling container, the inlet and output openings defining a longitudinal axis of said flow path, a plurality of square cross-sectional pins extending perpendicularly from said bottom portions, the corresponding pins of each container half tightly connected in rows diagonally oriented with respect to said longitudinal axis such that a plurality of generally zigzag cooling channels are formed in the flow path between said openings, said square pins oriented with the opposed corners thereof respectively parallel and perpendicular to said longitudinal axis of said flow path, whereby said pins are disposed with one pair of opposed corners facing upstream and downstream of liquid flow in said flow path.

4,151,549

SIMULATED STEREOSCOPIC TELEVISION PROJECTION SYSTEM

Jeff Bautze, 136 Lake Shore Dr., Marlboro, Mass. 01752

Filed Dec. 19, 1977, Ser. No. 861,840
Int. Cl.[2] H04N *9/54, 9/60*
U.S. Cl. 358—3 **10 Claims**



1. Television system selectively adaptable to three-dimensional viewing, said system comprising a projection television set, first, second, and third projector guns disposed on said set and adapted to project color images onto a screen, said first gun comprising a red color light projection gun, said second gun comprising a green color light projection gun and said third gun comprising a blue color light projection gun, means for selectively positioning said images projected by said first, second, and third projector guns, a first polarized filter for said first projector gun for polarizing light from said first projector gun vertically, a second polarized filter for said second projector gun for polarizing light from said second projector gun vertically, and a third polarized filter for said third projector gun for polarizing light from said third projector gun horizontally, and a pair of eye glasses including first and second polaroid sheets, said first sheet being polarized vertically and said second sheet being polarized horizontally, each of said polarized filters being movable between a first position in which said filter is disposed between its respective projector gun and said screen and a second position in which said filter is disposed in a location removed from its respective projection gun and the respective light projected therefrom onto said screen.

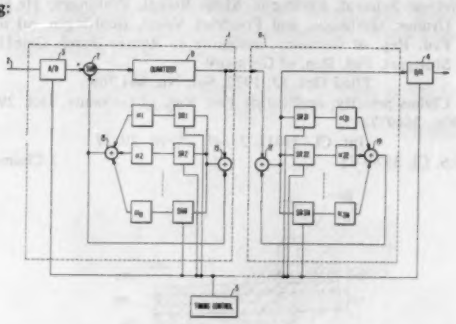
4,151,550

DPCM PREDICTORS FOR NTSC COLOR COMPOSITE TV SIGNALS USING PHASE ADJUSTMENT OF SAMPLING

Its'hak Dinstein, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jul. 7, 1977, Ser. No. 806,431
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—13 **10 Claims**

1. In a method of predicting a color television signal having a color carrier frequency f_{sc}, of the type wherein consecutive lines of said signal are sampled at a frequency in excess of the Nyquist rate, the sample values are stored and a plurality of stored sample values are algebraically combined to obtain a predicted value of a current sample, the improvement comprising:



sampling said television signal at a rate of $(n/m)\ f_{sc}$, where n and m are integers, and n is an even number; and

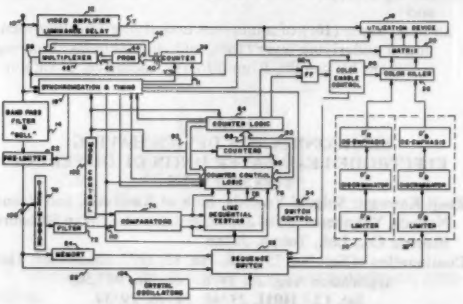
phase-shifting the sampling times of each line of said signal relative to the sampling times of the prior line of said signal.

4,151,551

PROGRAMMABLE COLOR ENABLE AND SEQUENCING SYSTEM FOR SECAM

Larry A. Nelson, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 4, 1976, Ser. No. 711,654
Int. Cl.[2] H04N *9/49*
U.S. Cl. 358—26 **11 Claims**



1. Programmable control means for a color television system, comprising:

programmable memory means for storing addressable bits of information therein which represent selected data corresponding to color standards;

means for converting signal portions contained within a composite video signal of the system into timing signals;

counter means responsive to said timing signals for providing address signals to said programmable memory means for selecting said addressable bits of information; and

means coupled to said programmable memory means for serializing said addressable bits of information received therefrom to provide an output control signal to the system.

4,151,552

AUTOMATIC BEAM CONTROL CIRCUIT RESPONSIVE TO AMBIENT LIGHT LEVEL HAVING UTILITY IN COLOR TELEVISION CAMERA

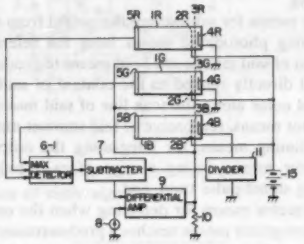
Kazuhiro Sato, Tokyo; Naoki Ozawa, and Shusaku Nagahara, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 795,510, May 10, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,193

Claims priority, application Japan, May 21, 1976, 51-85082; Jul. 19, 1976, 51-57801

Int. Cl.[2] H04N *9/04, 5/34*

U.S. Cl. 358—41 **21 Claims**



1. A television camera apparatus using at least one image pickup tube of photoconductive type having a beam current control circuit wherein said beam current control circuit comprises:

(a) first means for delivering plural signal currents;

(b) at least one current divider for taking out a current proportional to the cathode current of said pickup tube;

(c) a current converter circuit for delivering a current on the basis of said plural signal currents and the output current of said current divider;

(d) a reference current source;

(e) a differential amplifier for obtaining a difference current between the output current of said current converter circuit and the current from said reference current source; and

(f) second means for controlling the voltage applied to a beam current control electrode of said pickup tube by the output of said differential amplifier.

4,151,553

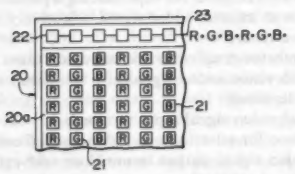
COLOR TELEVISION CAMERA

Yasumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Japan

Continuation-in-part of Ser. No. 588,718, Jun. 20, 1975, Pat. No. 4,054,915. This application Oct. 17, 1977, Ser. No. 843,146

Int. Cl.[2] H04N *9/07*

U.S. Cl. 358—44 **4 Claims**



1. A color television camera, comprising:

an image sensor comprising an array of photosensitive photoelements arranged in a matrix and each responsive to only one particular color component and said array including photoelements responsive to different color components, wherein ones of said photoelements responsive to the same particular color component are arranged in groups within the matrix, and wherein an optical image focused in use on said array of photoelements induces in respective ones of said photoelements a respective stored quantity of charge representative of an intensity of the particular color components of the optical image at the position of each of the respective photoelements,

means for simultaneously receiving quantities of charge from each group of photoelements responsive to a particular color,

means for ordering quantities of charge from each group responsive to a same particular color component to simultaneously develop sequences of quantities of charge each representative of a different color component of the optical image, and

means for providing the sequences of quantities of charge as output signal sequences each representative of a different color component of the optical image.

4,151,554

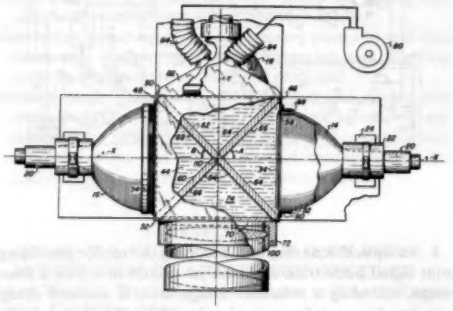
LIQUID COUPLED COLOR-TELEVISION IMAGE PROJECTOR

Arthur R. Tucker, 1 Tico Rd., Titusville, Fla. 32780

Filed Dec. 7, 1977, Ser. No. 858,358

Int. Cl.[2] H04N *9/16*

U.S. Cl. 358—60 **32 Claims**



1. A color-television image projector comprising:

a housing including a wall and an enclosed chamber;

television projection cathode ray tubes having image-producing face plates placed in the housing wall so as to communicate with the chamber, each cathode ray tube being capable of producing a single-color image for projection;

a transparent window in the housing wall;

color-selective mirror means located within the chamber for directing the single-color image from at least one of the cathode ray tubes to the window such that the images of the cathode ray tubes will be in superimposed registration with one another;

a transparent liquid filling the chamber and contacting the face plates, the mirror means, the window, and the housing wall, the transparent liquid having a relatively high index of refraction for bringing the focal plane of the superimposed images in close proximity with the window; and

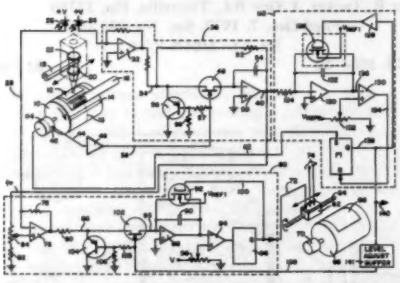
a projection lens system associated with the window for projecting the superimposed images appearing at the window.

4,151,555

OPTICAL SCANNING AND ENCODING DEVICE

James E. Burnett, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 25, 1977, Ser. No. 854,803
Int. Cl.[2] H04N *1/46*
U.S. Cl. 358—75 **11 Claims**



1. An optical scanning and encoding device for providing a print signal pulse train to an ink jet printer in which a master image, including a reference image area, is scanned along a scan line for a predetermined color of ink, and a print signal pulse train generated, comprising:

a tachometer for providing tachometer pulses in synchronism with scanning of said master image along said scan line,

optical scanning means for illuminating said master image and providing light reflected therefrom which is inversely related in intensity to the color content of the predetermined color being scanned along the scan line on the master image,

image scanning photodiode means and reference photodiode means positioned to receive light from said optical scanning means and to provide electrical output signals directly related to the intensity of the light,

reference pulse means for providing a reference pulse as said optical scanning means scans said reference image area,

sample and hold means, connected to said reference photodiode means and responsive to said reference pulse, for sampling and storing the output signal from said reference photodiode means upon receipt of a reference pulse and for providing a reference level at the output of said sample and hold means,

timing means, responsive to the output of said sample and hold means and to tachometer pulses, for providing a gating signal pulse train equal in frequency to said tachometer pulses and having pulses of a duration inversely proportional to the output of said sample and hold means, and

encoder means, responsive to the output from said image scanning photodiode means, for providing a print signal, including

summer means for subtracting the output from said image scanning photodiode means from the reference level output of said sample and hold means to produce a color signal directly related to the content of said predetermined color along the scan line of said master image,

integrator means, responsive to said summer means and to said timing means, for integrating the output of said summer means during receipt of each pulse in said gating signal pulse train, and

level detector means for detecting when the output from said integrator means reaches a predetermined level and for providing a print signal pulse to said ink jet printer and resetting said integrator means in response thereto.

4,151,556

Patent Not Issued For This Number

4,151,557

TELEVISION RECEIVER OPERATING MODE SELECTOR

Mikio Iida, Tokyo, and Mitsuru Hosoya, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 8, 1977, Ser. No. 804,764
Claims priority, application Japan, Jun. 11, 1976, 51-68956; Jun. 11, 1976, 51-76986
Int. Cl.[2] H04N *5/44, 5/76*
U.S. Cl. 358—188 **4 Claims**

1. A television receiver for reproducing a picture of a television signal or an external video signal, selectively, comprising:

a television tuner;

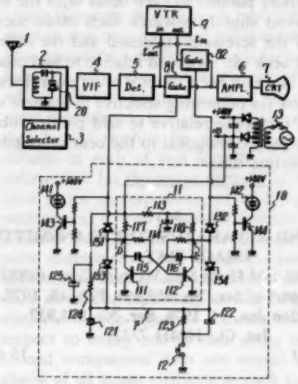
a video detector coupled to said television tuner for producing a television video signal at a television video signal output terminal;

an external video signal input terminal;

a gate means for selecting one video signal from said television video signal output terminal or said external video signal input terminal;

a flip flop circuit for controlling said gate means, said flip flop circuit having one state corresponding to the selection of said television video signal and one state corresponding to the selection of said external video signal, said flip flop circuit further having asymmetrical rising-up characteristics for controlling said gate means to select

said television video signal when electrical power is first provided to said flip flop circuit;



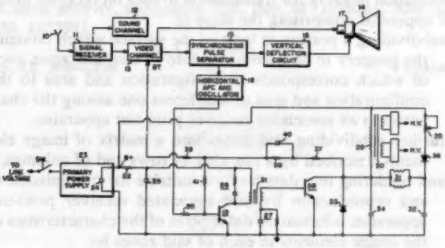
means for triggering said flip flop circuit to change the selection of video signals.

4,151,558

POWER SUPPLY DISCHARGE CIRCUIT FOR TV RECEIVER

David E. Manners, Alexander, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 3, 1978, Ser. No. 866,292
Int. Cl.[2] H04N *3/18, 5/44;* **H01J** *29/70*
U.S. Cl. 358—190 **4 Claims**



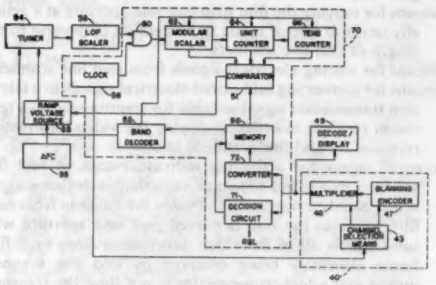
1. An improvement in a television receiver circuit having a primary power supply with at least one shunt capacitor, having a video channel circuit with a blanking input terminal, having an image display device with horizontal deflection winding and having a horizontal deflection circuit connected to said winding, said deflection circuit comprised in part of a driver transistor with grounded emitter, of an output transistor with grounded emitter and of a driver transformer coupling the collector of said driver transistor to the base of said output transistor, said collector of said output transistor directly coupled by blanking coupling means to said blanking input terminal of said video channel circuit, said power supply directly coupled to the collector of said output transistor by the primary of a flyback transformer and directly coupled to the collector of said driver transistor by a voltage dropping resistor and by the primary of said driver transformer, wherein the improvement comprises direct coupling means between a tap-off of said blanking coupling means and the base of said driver transistor for causing discharge of said shunt capacitor upon turn-off of said receiver.

4,151,559

ELECTRONIC TELEVISION TUNER INTERFACE CIRCUIT

Richard G. Merrell, Darien, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 6, 1977, Ser. No. 830,949
Int. Cl.[2] H04N *5/50*
U.S. Cl. 358—192 **5 Claims**



1. A tuning system for use with a television receiver comprising:

channel selection means operable for generating selected channel numbers for tuning all channels;

blanking encoder means for generating a blanking code in response to particular states of said channel selection means;

multiplexing means having a plurality of output data lines, said multiplexing means coupling, during alternate time intervals, the units and tens digits of a generated channel number to said data lines, said multiplexer means coupling said blanking code to said data lines during those of said time intervals corresponding to the generation of said blanking code;

memory means for storing generated channel numbers;

means responsive to said memory means for tuning said television receiver to a stored channel number;

conversion means coupling said memory means to said data lines, said conversion means converting said blanking code to a code representing digit zero; and

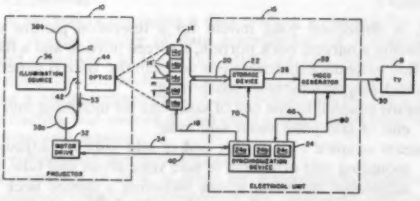
decision means coupled to said data lines and having first and second outputs, said decision means developing signals on said first output for enabling and inhibiting said memory means and signals on said second output for controlling the raster of said television receiver.

4,151,560

APPARATUS AND METHOD FOR DISPLAYING MOVING FILM ON A TELEVISION RECEIVER

Michael Zinchuk, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 27, 1977, Ser. No. 864,592
Int. Cl.[2] H04N *3/36*
U.S. Cl. 358—214 **13 Claims**



1. Apparatus for converting the video information from a

multi-frame transparent film strip to a television transmission signal suitable for receipt by a conventional television receiver which can display the video information derived from the film strip, said apparatus comprising:

a plurality of parallel, spaced apart, line scanners, each having an elongated linear array comprising a plurality of photosensitive elements for converting video information to electrical signal information;

means for defining a select aperture corresponding in size generally to one frame of the film strip;

means for moving the film strip past said aperture at a generally uniform rate of speed in a direction transverse to the length of said line scanners;

means for storing electrical signals from said line scanners;

means for converting said stored electrical signals to a television transmission signal suitable for transmission to a television receiver in order to display the video information received by said line scanners; and

control means for activating individual ones of said line scanners in a select sequence such that each line scanner receives only a portion of the video information from each film frame as the film is moved past said aperture with substantially all of the video information from each film frame ultimately being received by said line scanners during said select sequence, for controlling the transmission of said electrical signal information from said line scanners to said storing means as a functional relationship of said select sequence and for controlling the transmission of said stored electrical signal information to said converting means in another select sequence compatible with the field rate of the conventional television receiver.

4,151,561

ADJUSTABLE YOKE MOUNTING FOR IN-LINE BEAM COLOR TELEVISION PICTURE TUBE

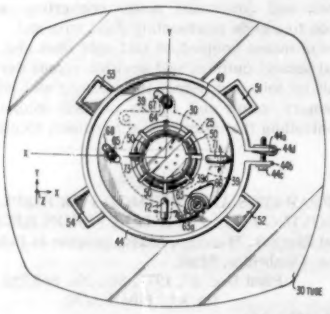
Jerrold K. Kratz, and Edward W. Christensen, II, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 6, 1977, Ser. No. 804,005

Claims priority, application United Kingdom, Jul. 6, 1976, 28056/76

Int. Cl.² H04N 9/28

U.S. Cl. 358—248 **10 Claims**



1. A deflection yoke mount for a television picture tube including a narrow neck portion, a screen portion and a flared portion extending therebetween wherein the yoke is generally a funnel shaped structure, comprising:

means coupled to one end of said yoke for mounting said one end of said yoke about said tube;

means coupled to the other end of said yoke for adjustably mounting said other end of said yoke about said tube, said adjustable mounting means including a slotted neck cap having an aperture therein adapted to hold about the neck of said tube;

said neck cap being fixed to said other end of said yoke by means including screws extending thru slots in the neck cap, said slots being generally 90° of arc from each other and are generally parallel to each other with the ends of the slots curved slightly towards each other such that when one of the screws is tightened and the others are loosened, the neck cap is rotated relative to said other end of said yoke and said neck about a pivot point located at the fixed screw for permitting selective movement of said other end of said yoke relative to said picture tube in a plane substantially orthogonal to the central longitudinal axis of said picture tube.

4,151,562

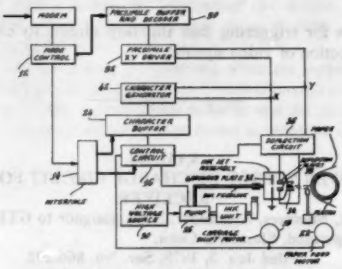
METHODS AND APPARATUS FOR TRANSMITTING IMAGE DATA

John L. Tregay, 46 Old Hyde Rd., Weston, Conn. 06883

Continuation-in-part of Ser. No. 550,864, Feb. 18, 1975. This application Jan. 24, 1978, Ser. No. 871,937

Int. Cl.² H04H 7/12

U.S. Cl. 358—260 **15 Claims**



1. A method of preparing data bit information descriptive of information imagery for transmission to data bit receiver print-out apparatus comprising the steps of

subdividing a portion at least of the surface which contains the imagery to be transmitted into at least one zone, each of which corresponds in configuration and area to the configuration and area of a different one among the characters in an associated receiver print-out apparatus,

further subdividing said zones into a matrix of image elements described by a plurality of rows and of columns,

and rendering into data bit form suitable for transmission to and reproduction by said associated receiver print-out apparatus, information descriptive of the characteristics of the image elements in each of said zones by

establishing data bit information describing the image characteristics for a row reference series of image elements for each of said scan zones, each of which elements corresponds positionally and in the dimension thereof which is in the direction of orientation of said columns to the image elements comprising one of said rows of said scan zone,

establishing data bit information describing the image characteristics for a column reference series of image elements, for each of said scan zones, each of which elements corresponds positionlly and in the dimension thereof which is in the direction of orientation of said rows to the image elements comprising one of said columns of said scan zone,

establishing data bit information for describing the image characteristics of all of the image elements in each of said scan zones,

making a first comparison of the data bit information for each image element in each row in each of said scan zones with the data bit information for the image element in the row reference series corresponding to each row in said scan zone, and with respect to every one of

said zones as to which, for all rows therein, said first comparision reveals complete redundancy of all of the image elements in each such row with the image element in said row reference series corresponding to said row, encoding a distinctive code signal to indicate this fact, and with respect to every one of said zones as to which said first comparison does not reveal such complete redundancy, making a second comparison of the data bit information for each image element in each column in each of said scan zones with the data bit information for the image element in the column reference series corresponding to each such column, and with respect to every one said zones as to which, for all columns therein, said second comparison reveals complete redundancy of all image elements in each such column with the image element in said column reference series corresponding to said column, encoding a distinctive code signal to indicate this fact, and with respect to every one of said zones as to which said second comparison does not reveal complete redundancy of all image elements in each such column with the image element in said column reference series corresponding to said column, encoding a distinctive signal to indicate that fact,

and, with respect to every one of said zones as to which neither said first comparison nor said second comparison reveals complete redundancy as aforesaid, compiling data bit information descriptive of the characteristics of each of the image elements in said zone.

4,151,563
ARRANGEMENT FOR THE RECORDING OF RASTERED HALF TONE PICTURES TO AVOID STRIPING

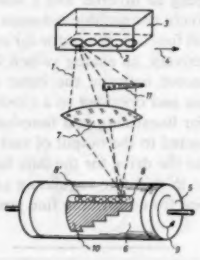
Uwe Gast, Rammsee, and Heinz Taudt, Kiel, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 17, 1977, Ser. No. 852,572

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652991

Int. Cl.[2] H04N *5/84*

U.S. Cl. 358—298 **4 Claims**



1. An arrangement for the recording of rastered half tone pictures, in which each raster point is formed on the recording medium by a plurality of parallel recording lines, extending in the recording direction, produced by a plurality of individually controlled light beams, discharged from beam emergence openings, of a recording device, aligned in a row extending transversely to the recording direction, and focused on the recording medium by objective lens means disposed on the beam path between said emergence openings and said recording medium, comprising an optical element interposed in the path of the light beams, said optical element being dimensioned to be operative on approximately half of the number of beams and oriented to refract the beams impacting it in the direction of alignment of said emergence openings, for effecting exposure of areas of the recording medium intermediate the areas impacted by the remaining unrefracted beams, thereby eliminating unexposed portions of the recording media between said parallel recording lines.

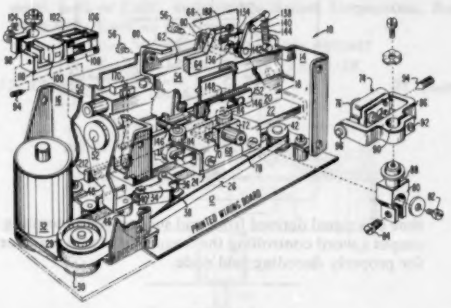
4,151,564
MODULAR, SEMIAUTOMATIC CREDIT CARD READER/WRITER APPARATUS

James N. Schreiber, Livonia, and Donald L. Bumgardner, South Lyon, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 857,032

Int. Cl.[2] G11B *25/04*; G06K *7/08*; G11B *5/09, 21/10*

U.S. Cl. 360—2 **12 Claims**



1. Magnetic credit card reader/writer apparatus comprising:

an elongated rigid member disposed adjacent to a credit card receiving aperture or throat and provided with oppositely disposed card abutting means for registering at least an edge portion of said card,

electromagnetic transducer means including means permitting said transducer freedom of motion in orthogonal planes relative to said credit card,

means operably associated with said registering means and positionably adjustably movable relative to said registering means for establishing a fixed reference plane of movement for said transducer adjacent to said credit card,

means to immobilize said transducer in at least one of the planes of movement relative to said credit card

means operably associated with said card receiving throat and adapted to automatically block said throat effectively impeding the ingress or egress of a credit card relative thereto, and

demountable means providing a synchronizing timing track for said electromagnetic transducer means.

4,151,565
DISCRIMINATION DURING READING OF DATA PRERECORDED IN DIFFERENT CODES

Mario Mazzola, Bresso, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed May 6, 1977, Ser. No. 794,513

Claims priority, application Italy, May 20, 1976, 68232 A/76

Int. Cl.[2] G11B *5/09, 27/10*

U.S. Cl. 360—40 **5 Claims**

1. A method of operating a data reading apparatus for decoding during reading of data prerecorded on a magnetic support selectively in the codes MFM or DF, wherein said data comprises for each code a code identification preamble having a predetermined pattern, and comprising the steps of:

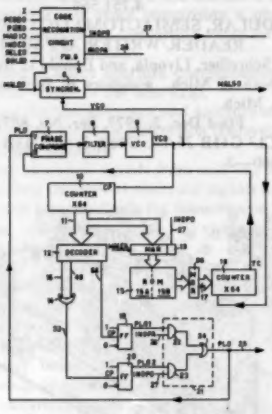
(a) reading said pattern of said code identification preamble from said support;

(b) recognizing the recording code used;

(c) operating an AFC control for generating a waveform adapted for the conversion of the recording code into binary code;

(d) selecting in said AFC control a digital memory region corresponding to said code;

(e) addressing a word in said region according to the relative phase of said waveform and said read signal, the address being represented by the count reached by a counter at the



time of a signal derived from said support for generating in output a word controlling the frequency of said waveform for properly decoding said code.

4,151,566

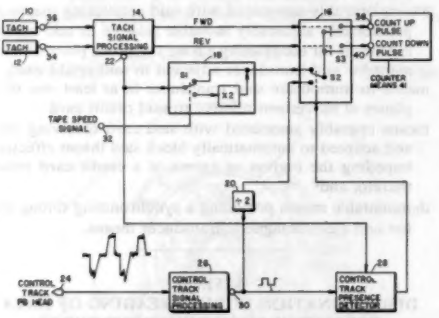
MAGNETIC TAPE POSITION MEASURING SYSTEM

Timothy P. Ohrman, Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,708

Int. Cl.[2] G11B *15/18*

U.S. Cl. 360—72.1 **2 Claims**



1. A measuring system for determining the position of a magnetic tape in a magnetic recorder/reproducer wherein said recorder/reproducer includes a tape roller tachometer and a control track signal recorded on said magnetic tape, comprising:

first signal means responsive to said control track signal for developing a first position indicating signal;

counter means coupled to said first signal means, said counter means being responsive to said position indicating signal for indicating the position of said magnetic tape;

second signal means responsive to said tape roller tachometer for developing a second position indicating signal;

detector means for developing a control signal determinative of the presence or absence of said control track signal; and

switch means coupled to said counter means and said first and second signal means, said switch means being responsive to said detector control signal for substituting said second position indicating signal only in the absence of said control track signal to provide a continuous tape position indication on said counter means.

4,151,567

CIRCUIT ARRANGEMENT FOR OFFSETTING THE DATA HEADS OF A DATA CYLINDER MEMORY BY A DETERMINATE AMOUNT FROM THE MID-POSITION OF THE DATA CYLINDER

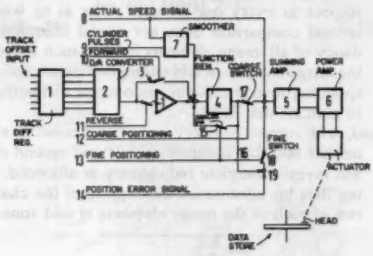
Stephen Dorsemagen, Munich, and Hermann Eiting, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,640

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2629473

Int. Cl.[2] G11B *5/56*

U.S. Cl. 360—75 **1 Claim**



1. A positioning circuit arrangement for offsetting the data heads of a data cylinder memory by a determinate amount from the data cylinder mid-position, comprising a fine regulating circuit, a coarse regulating circuit including a track difference register for storing the offset distance in binary form, a digital/analog converter connected to said track difference register for converting the digital content to an analog signal, a function generator, and a forward/reverse arrangement which serves to form the sign of the analog signal which is indicative of the direction of offset, said forward/reverse arrangement including an inverter and a shunt for said inverter which are selectively connectible between said digital/analog converter and said function generator for reverse and forward directions, respectively, an analog switch in said fine regulating circuit connected between the input and output of said function generator and operated to a closed condition during fine regulation, for linearizing said function generator, a summing point connected to the output of said function generator and connectible to the drive for the data heads, and a position error signal input in said fine regulating circuit connected to said summing point for controlling fine positioning of the data heads.

4,151,568

CIRCUIT ARRANGEMENT FOR THE SLOW, CONSTANT FORWARD OR REVERSE MOVEMENT OF THE WRITE/READ HEADS IN A CYLINDER MEMORY

Stephan Dorsemagen, Munich, and Hermann Eiting, Unterpfaffenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,642

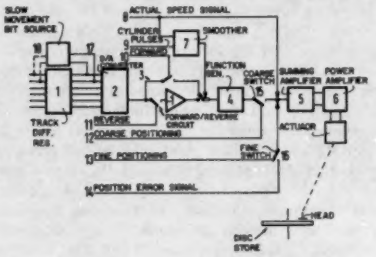
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633924

Int. Cl.[2] G11B *5/56*

U.S. Cl. 360—75 **4 Claims**

1. In a circuit arrangement for providing a slow, constant forward or reverse movement of the write/read heads in a disc memory which has a course regulating circuit of the type in which a track difference register stores the path to a target track as a multi-bit word in binary form, a digital/analog con-

verter converts the content of the register into an analog signal representing the distance to the target track, a forward/reverse circuit operates to provide the analog signal with a sign representing the direction of the target track and a function generator combines the analog signal having the sign and an actual speed signal to provide a theoretical speed signal to a circuit for comparing and obtaining the difference between the actual and theoretical speed signals for operating a positioning drive, the improvement in combination therewith comprising:



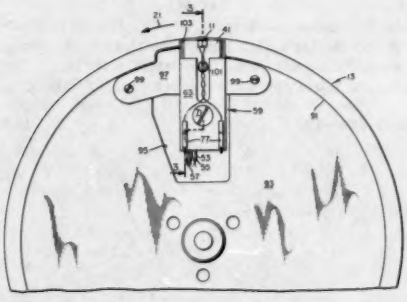
means for activating at least one of the least significant digital bits of the multi-bit word either upstream or downstream of the track difference register and feeding the same to the digital/analog converter to supply an additional input to said digital/analog converter to provide for a constant flow speed movement of the write/read heads range.

4,151,569

POSITIONABLE TRANSDUCER MOUNTING STRUCTURE USING A PIEZOELECTRIC BENDER ELEMENT

Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,651
Int. Cl.[2] G11B *21/10, 5/52, 21/18*
U.S. Cl. 360—77 **29 Claims**



1. A magnetic head assembly for use in a recording and/or reproducing apparatus in which a magnetic head is carried by a rigid support element in transducing relation with a magnetic record medium for recording and/or reproducing information with respect to an elongated track on the magnetic record medium during periods of relative motion between the magnetic head and the record medium, comprising:

a controllable positioning member with said magnetic head mounted at a location thereon to be positioned in transducing relation with the elongated track;

said controllable positioning member being attached to said support element so as to be substantially fixed with respect thereto against bodily translation; and

said controllable positioning member being movable at said magnetic head location for traversing motion displacement of the mounted magnetic head laterally away from said track, with each portion of said positioning member being laterally displaced to a degree that is a function of the first exponential power of the position of said portion along that dimension of said member that is generally most normal to the record medium surface; and

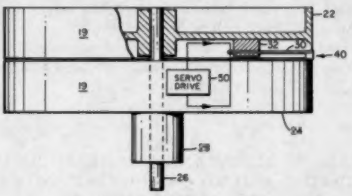
said positioning member being substantially rigid in directions orthogonal to said lateral displacement.

4,151,570

AUTOMATIC SCAN TRACKING USING A MAGNETIC HEAD SUPPORTED BY A PIEZOELECTRIC BENDER ELEMENT

Raymond F. Ravizza, Cupertino, and James R. Wheeler, Belmont, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 22, 1976, Ser. No. 669,047
Int. Cl.[2] G11B *21/10, 5/52, 21/18*
U.S. Cl. 360—77 **27 Claims**



1. A data reproducing system comprising a transducer for reproducing data signals recorded along a track on a record medium, a positionable element for mounting said transducer for displacement lateral to the track, oscillation means coupled to said positionable elemment to provide a continuous lateral oscillation of the position of said transducer about a bias position as data signals are reproduced to thereby alter the reproduced data signal, sensing means operatively associated with the transducer and continuously responsive to the data signal reproduced thereby to generate a control signal continuously indicative of the alterations in the reproduced data signal when said transducer is reproducing data signals from the track, and servo means coupled between the sensing means and the positionable element and responsive to the control signal to displace the positionable element to adjust the bias position of the transducer, said servo system being responsive to said control signal when said element is positioned at said bias position on or either side thereof.

4,151,571

METHOD OF WRITING ADDRESSES ON A MAGNETIC RECORDING MEDIUM

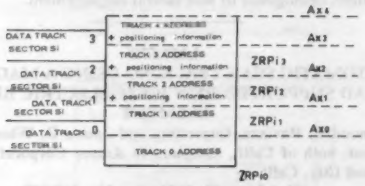
Claude R. Cardot; Jacques P. Droux, both of Paris, and André J. Oisel, Elancourt, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Feb. 2, 1977, Ser. No. 765,058
Claims priority, application France, Mar. 31, 1976, 76 09357
Int. Cl.[2] G11B *21/10, 5/09*
U.S. Cl. 360—77 **18 Claims**

1. A magnetic recording medium for address information to position a magnetic head and data, comprising a plurality of binary coded tracks, a sub-group of information items needed to position the head, the information items being recorded in sets of reference zones, each track being associated with at least one zone,

each of said zones containing a plurality of individual cells, each of said cells containing an item of head-positioning information defined by a first change in magnetization polarity sense followed by a second change in magnetization polarity sense, the magnetization sense of a first ele-

mentary magnetic area in all cells of each zone always being of the same polarity, the magnetization sense of the first elementary magnetic area of different zones susceptible of being different, the first elementary magnetic area of each cell preceding the first magnetization sense change of the cell, the track addresses being written within each zone, the number of individual cells in each zone being the



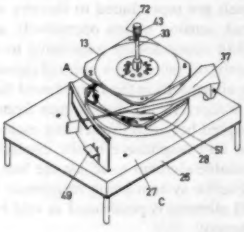
same as the number of bits in the address, each set of zones including an indexing magnetic region to allow the beginning of the set to be found, one of the magnetization sense changes in each cell occupying one of only two predetermined positions in each cell, the value of each address bit being indicated by the position occupied by the one magnetization sense change in each cell.

4,151,572

SOUND RECORDING AND REPRODUCING APPARATUS, AND RECORD CONTAINING CASE AND RECORDING MEDIUM

Hiroshi Yamamoto, 4-14-11, Shimotakaido, Suginami-ku Tokyo, and Isuke Sato, 1081, Tsurumaki Hatano City Kanagawa Pref., both of Japan

Filed Nov. 22, 1977, Ser. No. 854,071
Int. Cl.[2] G11B *17/22, 23/02*
U.S. Cl. 360—98 **22 Claims**



1. In combination:

a recording media containing case having separable mating upper and lower parts;

a stack of a plurality of sheet-like recording media in said casing stacked one on top of the other and each having an outer area on which information can be recorded and having a central area for containing aligning and selecting apertures, said central area having:

(a) a central aperture with a plurality of elongated slits extending radially outwardly from the edge of the aperture;

(b) a plurality of elongated radial openings regularly spaced circumferentially around said central aperture and outside of said central aperture, said central area having a gap between at least two of said radial apertures; and

(c) a plurality of locating apertures spaced at regular circumferential intervals outside of said elongated radial apertures; said recording media being at different rotational positions around the central aperture with the locating apertures aligned and the gap of each recording medium at a different rotational position than the gaps of the other recording media;

each of the parts of said case having a central guide aperture aligned with the central apertures of the stack of recording media and a slit extending outwardly from said central guide aperture aligned with the slits in the recording media, a plurality of elongaged radial openings spaced circumferentially around said central guide aperture and aligned with the corresponding radial openings in the recording media, record locating projections extending through the locating apertures in the recording media, and recording locating apertures for receiving the ends of locating projections on the other case part for holding the recording media firmly in position in the case, and locking means engaging a corresponding locking means on the other case part for locking the case parts together, and apertures in the case part adjacent said locking means; and

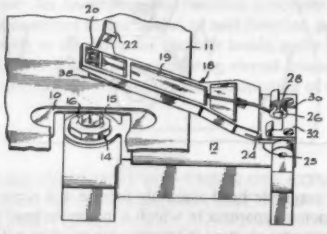
a recording and reproducing apparatus having a chassis, a turntable on said chassis on which said case is removably mounted, said turntable having a central recess therein, a central hollow vertical guide shaft on said turntable above said recess and extending through the central guide apertures in the parts of the casing and through the central guide apertures in the parts of the casing and through the central apertures in the stack of recording media and having a rib thereon engaged in said slits, a vertical operating rod extending through said guide shaft and having a horizontal plate member on the bottom end thereof in said recess, rod means on said plate member and extending upwardly and movable through the elongated radial openings in the case and the recording media to engage the gap of a recording media above a selected medium when the operating rod is raised for lifting the engaged recording medium and lifting the portion of the stack of recording media above the selected medium and the upper part of the case for exposing the selected recording medium, unlocking means on said turntable extending through the apertures in the case adjacent the locking means for unlocking the locking means, and a transducing means on said chassis and movable into engagement with an exposed recording medium in the case for recording and/or reproducing from the recording medium.

4,151,573

MAGNETIC RECORDING DEVICE FOR DOUBLE SIDED MEDIA

Sirjang L. Tandon, Northridge; Alfred C. Hackney, Simi Valley, and Roy A. Applequist, Sunnyvale, all of Calif., assignors to Tandon Magnetics Corp., Chatsworth, Calif.

Filed Jun. 13, 1977, Ser. No. 805,731
Int. Cl.[2] G11B *5/58*
U.S. Cl. 360—104 **16 Claims**



1. A device for maintaining a pair of magnetic transducers in operative relation with both sides of a non-rigid planar magnetic recording media comprising:

a first transducer mounted relative to a first side of the media and having a fixed position in a direction normal to the plane of the media despite movement to different positions along the plane of the media, the first transducer being disposed in data transfer position relative to the media;

a support mechanism adjacent to the second side of the media in a region opposite the first transducer;

a second transducer coupled by gimbal support means to the support mechanism in opposition to the first transducer and movable toward and away from the plane of the media; and

means coupled to said support mechanism for urging said second transducer toward said first transducer and said media to maintain both transducers in operative relation with the intervening media with the first transducer serving as a fixed positional reference despite tendencies of the media to deviate in position from its nominal plane and the second transducer matingly accommodating said tendencies by virtue of its gimbal support.

4,151,574
MAGNETIC HEAD USING A MAGNETIC FIELD-SENSITIVE ELEMENT AND METHOD OF MANUFACTURING SAME

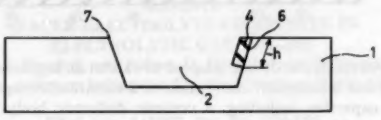
Jan Gerkema, and Gerrit J. Koel, both of Emmasingel Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 690,530, May 27, 1976, which is a continuation of Ser. No. 579,845, May 22, 1975. This application Feb. 23, 1978, Ser. No. 880,442

Claims priority, application Netherlands, May 24, 1974, 7406962

Int. Cl.² G11B *5/22, 5/30*

U.S. Cl. 360—113 **2 Claims**



1. A magnetic head for reading data which are magnetically recorded on an associated relatively movable medium which comprises: a substrate having a generally planar face disposed in facing relationship with the associated medium, said face having a groove therein, said groove having a first side wall disposed in oblique relationship to said face, a magnetic field-sensitive element in the form of a thin film carried solely on said side wall of said groove and means for connecting said element to associated external sensing circuitry.

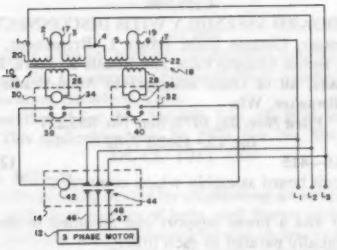
4,151,575
MOTOR PROTECTIVE DEVICE

Maurice A. Hogue, 4311 Gordon, Greenville, Tex. 75401

Filed Mar. 7, 1977, Ser. No. 774,884

Int. Cl.² H02H *7/09*

U.S. Cl. 361—33 **7 Claims**



1. Apparatus for protecting a three phase electrical motor having a magnetic starter from a loss of power on one or more input lines of a three phase power source supplying said motor comprising:

first and second transformers each having a primary winding with one side connected to one side of the other primary winding and to a first one of the input lines and other side of each primary winding being connected to second and third ones, respectively, of the input lines; and

first and second relays connected to the secondary windings of the first and second transformers respectively, each having a coil connected in series to the secondary winding of said first and second transformers respectively, said relays having sufficient sensitivity to deactuate when the voltage of the secondary windings of said first and second transformers is each half or less of its normal operating voltage;

the coils of said first and second relays actuating first and second switches respectively, said first and second switches being connected together in series with each other and with the magnetic starter.

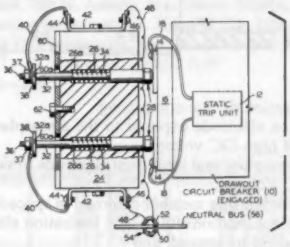
4,151,576
TRANSFORMER SECONDARY DISCONNECT AND SHORTING SWITCH

Joseph F. Johnson, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,950

Int. Cl.² H02H *7/04;* H01H *9/00*

U.S. Cl. 361—35 **7 Claims**



1. A disconnect for making and breaking a signal circuit between the secondary winding of a switchboard mounted neutral current transformer and the static trip unit of a circuit breaker mounted by electrical drawout apparatus for movement between engaged and disengaged positions with respect to the switchboard, said disconnect including, in combination:

A. a pair of planar conductive pads mounted in electrically isolated interrelation to the drawout apparatus and separately wired to the static trip unit;

B. an insulative body mounted to the switchboard;

C. means forming a pair of bores in said body;

D. a separate conductive plunger having a rounded forward end and reciprocally mounted in each said bore, said plungers being respectively wired to the two sides of the neutral current transformer secondary winding;

E. a separate spring accommodated in each said bore for biasing each said plunger forwardly toward the drawout apparatus to an extended position;

F. an electrically conductive element carried by said body; and

G. a switch contact carried by each said plunger, each said switch contact electrically engaging said element while its associated plunger is in its extended position;

H. whereby, with the drawout apparatus in its extended position, the secondary winding and static trip unit are electrically disconnected and the plungers are in their respective extended positions to switch said element across the two sides of the neutral current transformer secondary winding, and, upon movement of the drawout apparatus toward its engaged position, said pads individually engage said forward ends of said plungers to complete the signal circuit between the secondary winding and static trip unit, the area of the planar surface of each said

pad normal to the axis of its associated plunger being large relative to the cross-sectional area of its associated plunger, said plungers being pushed rearwardly to retracted positions in response to the movement of the drawout apparatus into its engaged position while maintaining signal circuit continuity and, coincidentally, switching said element out from across the two sides of the neutral current transformer secondary winding.

4,151,577

IONIZATION DEVICE EMPLOYING A GROUNDED INSULATIVE HOUSING MEMBER SPACED FROM AN IONIZATION ELECTRODE

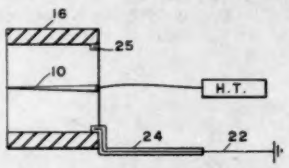
Mordechai Yavnieli, Tel Aviv, and Meir Zeldov, Herzlia, both of Israel, assignors to Amcor Ltd., Tel Aviv, Israel

Filed Dec. 22, 1976, Ser. No. 753,445

Claims priority, application Israel, Jan. 9, 1976, 48817; Mar. 16, 1976, 49220

Int. Cl.² H05F *3/02*

U.S. Cl. 361—231 **7 Claims**



1. An ionization device comprising:
an ionization electrode exposed to the atmosphere;
a source of high DC voltage;
means for coupling said ionization electrode to said source of high DC voltage;
an insulative housing member disposed in spaced non-touching adjacent relationship to said ionization electrode;
a wire coupled to ground; and
an insulative peripheral coating completely surrounding said wire;
said thus coated wire being disposed between said insulative housing member and said electrode in an uninterrupted line of sight with respect to said ionization electrode and providing a controlled flow of electric charges from said insulative member to ground.

4,151,578

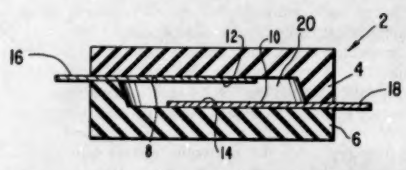
CAPACITIVE PRESSURE TRANSDUCER

Robert L. Bell, Chatsworth, Calif., assignor to Kavlico Corporation, Chatsworth, Calif.

Filed Aug. 1, 1977, Ser. No. 820,767

Int. Cl.² H01G *7/00*

U.S. Cl. 361—283 **5 Claims**



1. A capacitive pressure transducer comprising:
a pair of electrically insulative elastic diaphragms disposed adjacent each other and bonded together by a fired glass frit in a spaced apart relationship to form a sealed cavity;
a conductive layer applied to the inside surface of each of the diaphragms, the capacitance of said capacitive pressure transducer when unfilled having a negative temperature coefficient resulting from the modulus of elasticity of said spaced apart diaphragms and having a significant departure from rated capacitance throughout a desired useful range of 50% to 100% of full scale pressure; and
means for substantially reducing said departure from said rated capacitance in said desired useful range, said means including a small absolute pressure with a positive temperature coefficient backfilled in said cavity so that the effects of the negative temperature coefficient of the modulus of elasticity of said diaphragms is substantially reduced over a useful range from 50 to 100% of full scale applied pressure.

4,151,579

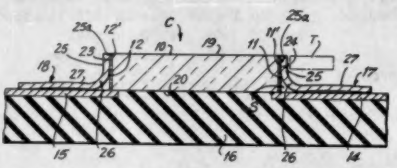
CHIP CAPACITOR DEVICE

Richard A. Stark, Wichita Falls, Tex., assignor to AVX Corporation, Great Neck, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,900

Int. Cl.² H01G *1/035, 1/14*

U.S. Cl. 361—308 **1 Claim**



1. An electrical device adapted to exhibit an improved electrical and mechanical connection to a substrate, comprising a chip capacitor including, a ceramic dielectric body having upper and lower planar surfaces and opposed first and second spaced parallel end surfaces normal to said upper and lower surfaces, first and second electrical terminals formed on and substantially completely covering said end surfaces, first and second flexible connector tabs electrically and mechanically connected to said first and second terminals, respectively, said tabs including attachment portions affixed to said electrical terminals along connection lines adjacent the junction of said end surface and said upper surface, said tabs further including outwardly directed coplanar mounting portions, the area between said attachment portions and said mounting portions of said tabs including arcuate flexible portions, said arcuate flexible portions of said tabs being spaced from said end surfaces of said body in the area between said attachment portions and said lower surface of said dielectric body and further being spaced from surfaces of a substrate to which the mounting portions of the tabs electrically and mechanically connect in use.

4,151,580

CIRCUIT BOARD ASSEMBLY WITH DISCONNECT ARM

Odo J. Struger, Chagrin Falls; Edwin L. Bremenour, Euclid; James F. Burns, Chagrin Falls, and Ronald E. Jerva, Mentor-on-the-Lake, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

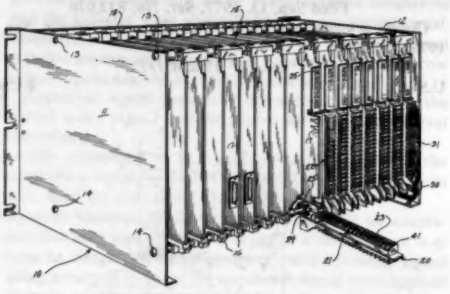
Filed Nov. 21, 1977, Ser. No. 853,227

Int. Cl.² H02B *1/02*

U.S. Cl. 361—415 **12 Claims**

1. A circuit board assembly which comprises:
a frame;
an upper and a lower support rod mounted to the frame substantially parallel to each other;
a plurality of lower guide rails mounted at regular intervals along the lower support rod;
a plurality of upper guide rails mounted at regular intervals along the upper support rod, each of the upper guide rails being disposed above one of the lower guide rails to receive a circuit board therebetween; and
an electrical connector associated with a circuit board which

is mounted between one of the upper guide rails and one of the lower guide rails, the electrical connector being rotatably mounted at one end to one of the support rods in an interval between the guide rail which mounts the circuit board and an adjacent guide rail, the electrical connector being rotatable between an operating position in which it engages the circuit board and a maintenance position in which the circuit board can be removed from between the upper and lower guide rails which mount it.

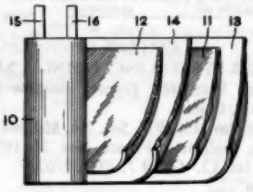


4,151,581

SPACER-ELECTROLYTE COMPOSITE IN ELECTROLYTIC CAPACITORS

Walter J. Bernard, and Sidney D. Ross, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 4, 1977, Ser. No. 821,850
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 **7 Claims**



1. An electrolytic capacitor having a plurality of foil electrodes, a dielectric film on those electrodes which are anodes, and a cellulose triacetate polymer-liquid composite as spacer, said composite containing as internal liquid phase the capacitor electrolyte.

4,151,582

POINT ARRAY SHEET LIGHTING APPARATUS

Lawrence W. Grunberger, Peekskill, N.Y., assignor to Izon Corporation, Stamford, Conn.

Continuation of Ser. No. 536,409, Dec. 26, 1974, abandoned. This application Mar. 24, 1978, Ser. No. 889,736
Int. Cl.[2] F21V 7/04
U.S. Cl. 362—31 **12 Claims**

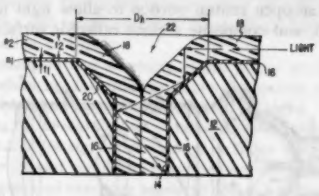
1. An illuminating device for establishing an array of closely-spaced individual sources of light, said device including,

(a) a generally planar substrate having an array of individual apertures extending therethrough, said apertures being generally normal to the plane of the substrate,

(b) a first coating on one surface of said substrate, said coating being of a transparent material having a first index of refraction, said first coating extending from said one surface into the surfaces of said individual apertures,

(c) a second coating on top of and in contact with said first coating and being coextensive therewith, said second coating being transparent and having a second index of refraction greater than said first index of refraction,

(d) the surface of said second coating having an annular depression opposite each aperture in said substrate, each depression being of a depth at least equal to the thickness of said second coating,



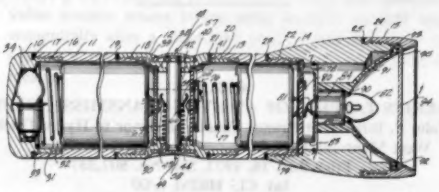
(e) whereby light directed to the edges of said coatings will be transmitted by internal reflection to the apertures and will exist from the apertures in the direction substantially normal to the plane of the substrate.

4,151,583

FLASHLIGHT

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Continuation-in-part of Ser. No. 655,426, Feb. 5, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 727,018
Int. Cl.[2] F21L 9/00
U.S. Cl. 362—205 **7 Claims**



1. A flashlight having a tubular housing with a back end, a front end, a first portion adjacent to the back end and adapted to receive at least one battery, and a second portion adjacent to the front end and adapted to receive at least one battery; a lamp assembly adapted to receive a light bulb; means for connecting the lamp assembly to the front end of the housing; means for closing the back end of the housing; and an electrical circuit including an ON-OFF switch between opposite terminals of the batteries received by the first and second portions of the housing and opposite terminals of a light bulb received by the lamp assembly, wherein the improvement comprises:

a third portion of the housing disposed between the first and second portions,

the switch filling the third portion of the housing to the exclusion of any batteries and forming a stationary barrier between the first and second portions of the housing to separate and protect batteries received by the first portion of the housing from batteries received by the second portion of the housing.

4,151,584

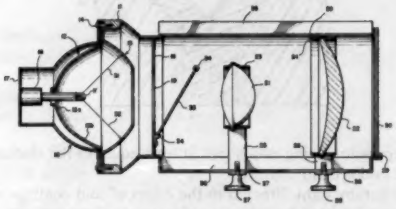
LIGHT-COLLECTING REFLECTOR

Joseph H. Labrum, West Jordan, Utah, assignor to Electro Controls Inc., Salt Lake City, Utah

Filed Mar. 14, 1977, Ser. No. 777,447
Int. Cl.[2] F21V 13/04
U.S. Cl. 362—302 **15 Claims**

1. A light-collecting reflector for use with a source of light, comprising a main reflector having a central parabolic reflect-

ing surface and an outer ellipsoidal reflecting surface and adapted to have a source of light placed along its central axis, said parabolic reflecting surface and said ellipsoidal reflecting surface being joined along their mathematical intersection; and a secondary reflector having a composite arcuate reflecting surface facing said reflector surfaces of the main reflector and having an open central portion to allow light to pass therethrough, said composite arcuate reflector surface of the sec-



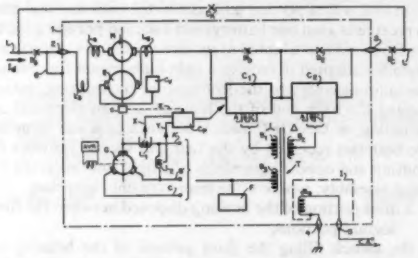
ondary reflector having radii that emanate from respective centers located on a circle whose center lies on the central axis of the main reflector, the radii extending from the reflector surface to the circle on the opposite side of the central axis from the respective parts of the reflection surface concerned, so that light striking the reflector surface of the secondary reflector is reflected back toward the reflecting surfaces of the main reflector.

4,151,585

SERIES TAPPING OF AN HVDC TRANSMISSION LINE

John P. Bowles, St-Bruno, Canada, assignor to Hydro-Quebec, West Montreal, Canada

Filed Jun. 16, 1977, Ser. No. 807,337
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—35 **13 Claims**



1. A system for extracting and converting the electrical energy conveyed by a high voltage direct current transmission line for feeding a load with complex power, said system being inserted in series with said transmission line and comprising:

means for extracting and converting said high voltage into AC active power;

means, exclusively fed from said transmission line, for generating reactive power feeding said extracting and converting means and said load connected across the system output; and

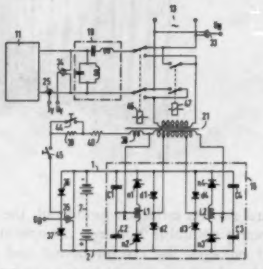
control means connected to said extracting and converting means and to said generating means to ensure a supply of said active power to the load from said extracting and converting means alone.

4,151,586

METHOD AND APPARATUS FOR SHUTTING DOWN AN INVERTER

Janos Udvardi-Lakos, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,920
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642240
Int. Cl.[2] H02M *1/18*
U.S. Cl. 363—57 **4 Claims**



1. A method for shutting down an inverter with bridge arms with controlled main valves and further bridge arms with recovery diodes, the control terminals of which are connected via an enabling unit to a control set, having as an input a control voltage determining the firing angle of the firing pulses comprising:

(a) monitoring the current conducting state of the valves;

(b) blocking a change of firing pulses for the main valves when the valves connected to one d-c bus of the inverter conduct current simultaneously; and

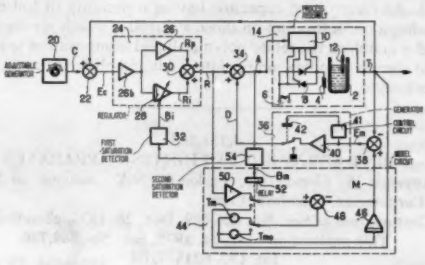
(c) after a predetermined time has passed blocking the transmission of the firing pulses to the controlled main valves.

4,151,587

REGULATOR SYSTEM INCLUDING A MODEL

Richard Bénéjean, Versailles, France, assignor to Alsthom-Atlantique, Paris, France

Filed Nov. 25, 1977, Ser. No. 854,964
Claims priority, application France, Nov. 25, 1976, 76 35511
Int. Cl.[2] G05B *13/02, 17/02*
U.S. Cl. 364—106 **6 Claims**



1. A regulator system for regulating a process by means of an actuator and in response to a command signal defining a desired state of the process and a measurement signal indicative of the actual state of the process, the system comprising:

a command error detector connected to receive the command signal and the measurement signal and to supply a command error signal representative of their difference;

a regulator responsive to the command error signal to produce a regulation signal suitable for controlling the actuator;

a model circuit connected to receive the regulation signal and arranged to model the behaviour of the process, i.e. to provide a model signal which varies substantially in the same way as the measurement signal would vary if the process were operating under predetermined conditions and the actuator were controlled by the regulation signal;

a model error detector arranged to receive the model signal and the measurement signal and to supply a model error signal representative of their difference;

an adaptation signal generator connected to receive the model error signal and to derive an adaptation signal therefrom;

an adder connected to sum the regulation signal and the adaptation signal to derive an action signal which is, in fact, used for controlling the actuator; and

saturation detection means arranged to provide an adaptation blocking signal when the actuator is saturated, or is at least in danger of being saturated, said blocking signal being arranged to cause the regulation signal to be applied directly as the action signal without the addition of the adaptation signal thereto; the model circuit being responsive to the adaptation blocking signal and so arranged that the model signal is equal to the measurement signal when the adaptation blocking signal ceases to be supplied.

4,151,588

METHOD AND APPARATUS FOR CONTROLLING ONE OR SEVERAL VARIABLES DEPENDING ON SEVERAL CONTROL INPUTS

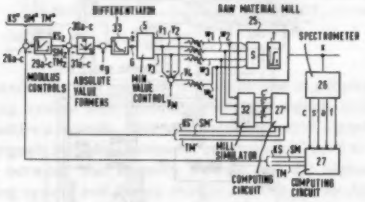
Hansjörg Hammer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,833

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637620

Int. Cl.[2] **G05B** *13/02, 17/02*

U.S. Cl. 364—106 **4 Claims**



1. Apparatus for controlling at least one variable in dependence on a plurality of control inputs to minimize an error function comprising:

(a) a plurality of bi-directional digital counters, the output signals of which form the control inputs;

(b) a clock generator;

(c) a circulating shift register;

(d) means to sequentially and cyclically couple the output of said clock generator to the count inputs of said bi-directional digital counters in dependence on the output signals of said circulating shift register;

(e) means for forming the absolute value of the difference between a predetermined target value and the actual value of the control quantity;

(f) a differentiator having the output of said means for forming as an input the output;

(g) a zero crossover detector having the output of said differentiator as an input;

(h) a counter which operates repetitively from zero to a definite value having the output of said detector as an input;

(i) means to reset said counter and to advance said shift register upon reaching said definite value; and

(j) a flipflop having the output of said detector as a trigger input, the output of said flipflop coupled to the inputs of said bi-directional digital counters determining the direction of counting.

4. In a raw material mill, a method of controlling at least one variable in dependence on a plurality of control inputs to the mill to minimize an error function comprising the steps of:

(a) automatically simulating actual values of said variable using a fast mill model simulator having the control inputs to the mill as its inputs;

(b) determining in first summing means a first set of error signals which are the difference between desired values of said variable and actual values of said variables;

(c) deriving, from said first set of error signals, target values of said variables and superimposed modulus controls;

(d) comparing said simulated actual values with said target values in second summing means to obtain a second set of error signals;

(e) determining the absolute value of said second set of error signals in absolute value forming means;

(f) finding the differential with respect to time of said second set of different signals in differentiating means;

(g) always varying one of the control inputs to the control system in steps at regular time intervals in the same direction until the sign of said differential with respect to time has changed from minus to plus using minimum value control means;

(h) thereupon varying the same control input in steps in the opposite direction using said minimum value control means;

(i) repeating said steps of varying in one direction and the other using said minimum value control means; and

(j) varying the remaining control inputs using said minimum value control means in the same manner cyclicly and sequentially after a respective predetermined number of said sign reversals using said minimum value control means.

4,151,589

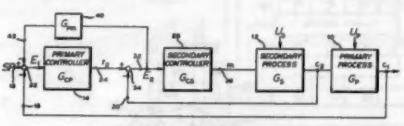
DECOUPLED CASCADE CONTROL SYSTEM

Charles W. Ross, Hatboro, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Feb. 3, 1978, Ser. No. 874,974

Int. Cl.[2] **G05B** *17/02*

U.S. Cl. 364—106 **5 Claims**



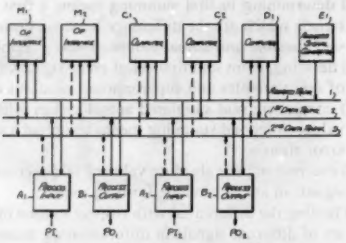
1. In a cascade control system wherein a primary process is controlled by a primary controller responding to a first error signal indicative of the deviation of a primary controlled variable from a first set point to modify a second set point, and a secondary process is controlled by a secondary controller responding to a second error signal indicative of the deviation of a secondary variable from said second set point, the improvement comprising:

means responsive to said second error signal for modifying said first error signal by an amount sufficient to reduce the effects on said first error signal of changes in said primary variable resulting from disturbances affecting said secondary process.

4,151,590
PROCESS CONTROL SYSTEM

Tadashi Azegami, Inagi, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,758
Int. Cl.[2] G06F *15/46*; G05B *7/00*
U.S. Cl. 364—115 3 Claims



1. A process control system for multiplex operation of several process control loops, the system being provided with process input and process output units, analog controller and computer operation units, and operator's interface stations, the exchange of information between the units and stations being carried out on a time-sharing basis, the system comprising:

(A) a first data trunk coupled to said units and stations to convey process information;

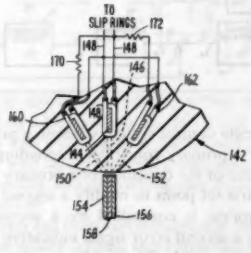
(B) an address trunk coupled to said units and stations to which address signals are supplied in accordance with a cyclic control routine to synchronize the exchange of information through the first data trunk; and

(C) means including a second data trunk having a group of lines making it possible, at one's option, to modify the cyclic control routine to select a desired mode of operation, said analog controller and computer operation units and said interface stations signalling whether operation in the manual, analog or computer state is possible, state signals being generated at the operator's interface stations to the respective units to control their transmitting or receiving state.

4,151,591
TRANSVERSE TRACK MAGNETIC TRANSDUCING HEADS

George C. Sziklai, 26900 St. Francis Rd., Los Altos Hills, Calif. 94022

Filed Jan. 12, 1978, Ser. No. 868,809
Int. Cl.[2] G11B *5/12*
U.S. Cl. 360—115 5 Claims



1. A magnetic transducing head, comprising:

a first plurality of closely juxtaposed ferromagnetic laminations;

a second plurality of closely juxtaposed ferromagnetic laminations;

a first edge portion of each lamination of said first plurality defining together with a first edge portion of a corresponding lamination of said second plurality one of a plurality of closely juxtaposed transducing gaps;

each of said laminations having a second edge portion lying adjacent a common cylindrical surface;

low reluctance bridging means;

non-magnetic rotor means for repeatedly carrying said low reluctance bridging means past equi-spaced perimetric positions defined by the successive pairs of said second edge portions when rotated, with the rotor axis and the axis of the common cylindrical surface being coincident so as to maintain a fixed gap between the rotor and said laminations;

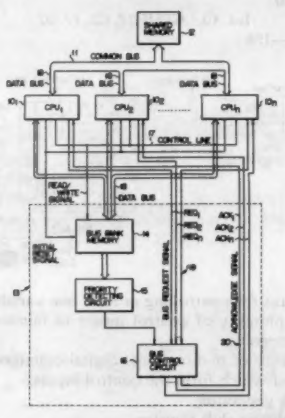
exciting winding means for producing flux in said bridging means and their associated laminations; and

a pair of auxiliary bridging means angularly disposed on opposite sides of each of said low reluctance bridging means for bridging the gaps between the second edge portions of the pairs of laminations lying immediately adjacent the pair of laminations bridged by said low reluctance bridging means and crosstalk compensating windings cooperating with said auxiliary bridging means so as to buck the effect of crosstalk in said transducer head.

4,151,592
DATA TRANSFER CONTROL SYSTEM

Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 15, 1976, Ser. No. 732,968
Claims priority, application Japan, Oct. 15, 1975, 50/124142
Int. Cl.[2] G06F *9/18*, *15/16*
U.S. Cl. 364—200 2 Claims



1. A data transfer control system for controlling the priority use of a common bus connected to and shared by a plurality of data processors having a priority order that can be changed comprising bus rank memory means, means for transferring to said bus rank memory means priority codes sent from said plurality of data processors, detection means connected to said bus rank memory means to detect the order of priority levels of said priority codes and generate an output priority signal indicative of the priority order of said data processors, means in each data processor for generating common bus request signals, and common bus control means connected to said detection means and said plurality of data processors to receive the common bus request signals generated by the data processors, to select in response to the output priority signal from said detection means the data processor supplying a common bus request signal having the highest priority and to supply a permit signal to the selected data processor, thereby permitting exclusive use of the common bus by said selected data proces-

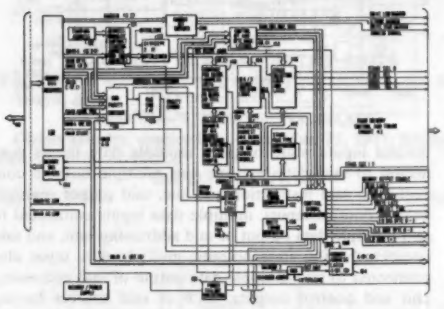
sor, said bus control means including means for stopping data transfer by a first data processor having exclusive use of the common bus and for permitting a second data processor to exclusively use the common bus when the second data processor produces a common bus request signal and has a higher priority order than the first data processor.

4,151,593

MEMORY MODULE WITH MEANS FOR CONTROLLING INTERNAL TIMING

Stephen R. Jenkins, Acton; Thomas A. Northrup, Westford, and Robert E. Stewart, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 658,113, Feb. 13, 1976, Pat. No. 4,055,851.
This application Jun. 9, 1977, Ser. No. 804,942
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **4 Claims**



1. A random access memory module for use in a digital data processing system that transmits electrical signals including sets of address signals, data signals and control signals, the control signals including a transfer control signal used to transfer data between said memory module and the digital data processing system and binary margin control signals for controlling operations in said memory module, said random access memory module comprising:

A. addressable storage means for storing digital data at individually addressed storage locations therein, said addressable storage means including means responsive to an analog signal for controlling the operation thereof,

B. address decoding means for generating an enabling signal when address decoding receives, from the digital data processing means, a set of address signals that identify a storage location in said addressable storage means,

C. timing means connected to said addressable storage means and said address decoding means, said timing means being responsive to the enabling signal and a transfer control signal for initiating a memory retrieval cycle during which data is transferred between the identified storage location and the digital data processing system, and

D. digital-to-analog conversion means responsive to the binary margin control signal received from the digital data processing system for generating an analog signal, and

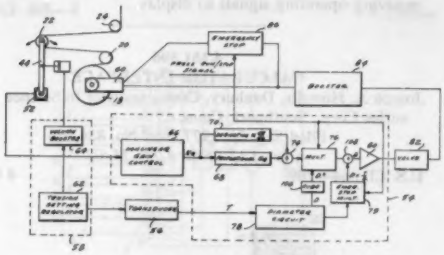
E. control means connected to said addressable storage means and said conversion means for controlling the operation of said addressable storage means in response to the analog signal.

4,151,594

WEB TENSION CONTROL FOR HIGH-SPEED WEB HANDLING EQUIPMENT

Nathan Stern, Caldwell, N.J., assignor to Bobst-Champlain, Inc., Roseland, N.J.

Filed Feb. 26, 1976, Ser. No. 661,768
Int. Cl.[2] G06F *15/20*; B65H *19/18, 25/22*
U.S. Cl. 364—400 **41 Claims**



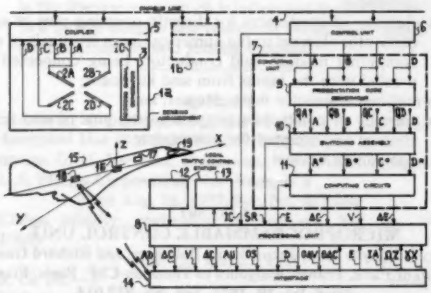
1. A method of web tension control in high speed web handling equipment of the type having a core support upon which the core of a web feed roll is rotatably mounted, a variable torque brake associated with the core exhibiting a substantially constant coefficient of friction at all speeds of the web and a dancer roller engaging the web and movable thereby in accordance with variations in web tension, the method comprising the steps of determining the initial diameter of the feed roll, setting the brake torque in accordance with the initial roll diameter thereof and varying the brake torque setting in accordance with variations in the diameter of the roll as the web is fed from the roll.

4,151,595

SYSTEM FOR CONTROLLING GROUND MOVEMENTS ON AIRFIELDS

Robert Pressiat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 14, 1977, Ser. No. 842,278
Claims priority, application France, Oct. 19, 1976, 76 31353
Int. Cl.[2] G08G *5/08*; G06F *15/48*
U.S. Cl. 364—439 **6 Claims**



1. A system for controlling ground movement on airfields comprising: on the ground, sensors for detecting pressure variations and which are distributed at known intervals along the routes of movement, each sensor comprising four linear elements forming four arms disposed two by two on both sides of the axis of the route for producing four items of data A, B, C, D corresponding to the respective times at which the lateral wheels of a vehicle pass across the said arms; calculating means for calculating, from the said items of data, parameters which represent the angular deviation ΔC of the heading of the vehi-

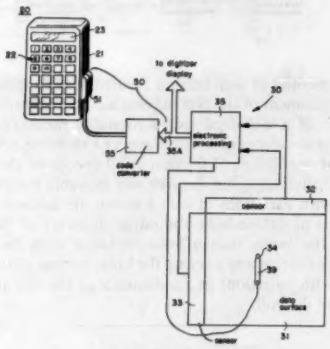
cle and the lateral deviation ΔE of the vehicle from the axis of the route of movement, and its speed V of movement and the sign SR thereof; means for transmitting the said items of data from one sensor at a time to the calculating means; processing and transmitter/receiver means for generating, from the said parameters and from vehicle identification data IA, E, operating signals for ground display and ground control of the traffic; and on board and vehicles, transmitter/receivers and display means for transmitting the said identification data and for receiving operating signals to display.

4,151,596

CALCULATOR INTERFACE

Joseph A. Howells, Danbury, Conn., assignor to Science Accessories Corp., Southport, Conn.

Filed Sep. 26, 1977, Ser. No. 836,366
Int. Cl.[2] G06F *3/00, 15/02*
U.S. Cl. 364—709 **4 Claims**



1. For use in conjunction with a hand-held calculator having a housing, an input keyboard on said housing, a computing module in said housing including input terminals coupled to the keys of the keyboard, and a display on said housing coupled to the output of the computing module; an interface of entering numeric information from an independent companion device into the computing module while maintaining full portability and independent use of said calculator, comprising:

a multipin connector element affixed to the housing of said calculator;

a plurality of conductors for directly coupling pins of said connector element to the numerical input terminals of the computing module, said conductors being connected in parallel with the inputs from said keyboard;

a multipin connector mate element; and

a plurality of conductors coupled to the pins of said mate element and adapted for connection to said independent companion device.

4,151,597

MICROPROGRAMMABLE CONTROL UNIT

Duyet Nguyen Huu; Jean-Claude Ballegeer, and Richard Guedj, all of Paris, France, assignors to Thomson-CSF, Paris, France

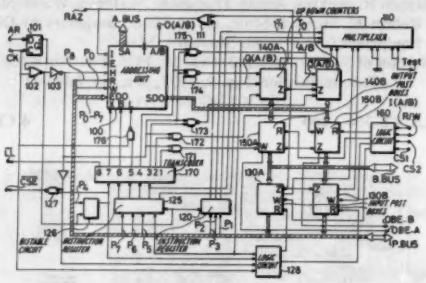
Filed Jul. 19, 1977, Ser. No. 817,014
Claims priority, application France, Jul. 23, 1976, 76 22623
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—900 **7 Claims**

1. A microprogrammable control unit for an interface circuit adapted to control two systems acting simultaneously according to two stored independent sequences of micro-instructions, a store for storing said sequences or micro-instructions, said microinstructions comprising code words divided in several control fields to direct the operation of said control unit, said control unit having an instruction input bus line and an address bus output line to connect to said store, a data bus line, control inputs, test input and timing input, said control unit comprising:

an addressing unit having an instruction input, control inputs, test input, timing input coupled to said timing input of said control unit, address output connected to said address bus output line, and a multiple data output, said addressing unit being adapted to deliver to said store, at a fixed clock rate determined by timing signals applied to said timing input of said addressing unit, instruction addresses corresponding alternately to microinstructions in one and the other sequence;

instruction register each having multiple inputs connected to said instruction input bus line, and multiple output coupled to said control inputs of said addressing unit;

sources including two input registers, two output registers and two up and down counters, said input registers having



control inputs, state outputs, multiple data inputs connected to said data bus line and multiple outputs connected to said instruction bus line, said output registers having control inputs, multiple data inputs connected to said multiple data output of said addressing unit, and said counters having state outputs, multiple data input also connected to said multiple data output of said addressing unit and control outputs, each of said sources having timing inputs coupled to outputs of a logic circuit having an input coupled to said timing input, said logic circuit selectively activating said sources responsive to said timing input for the coordination of data and instruction flow;

a multiplexer having inputs coupled to said state outputs and an input connected to said test input of said control unit and having control inputs coupled to outputs of an instruction register, said multiplexer having an output coupled to said test input of said addressing unit.

4,151,598

PRIORITY ASSIGNMENT APPARATUS FOR USE IN A MEMORY CONTROLLER

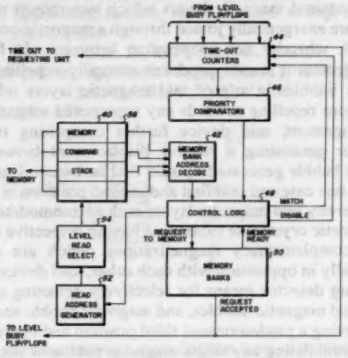
Marvin K. Webster, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoeniz, Ariz.

Filed Mar. 27, 1978, Ser. No. 890,119
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—900 **8 Claims**

1. An apparatus for assigning priority to information temporarily stored in a plurality of storage registers each of which forms a level in a multi-level storage stack, said information destined for at least one destination unit, which unit generates a ready signal indicating its availability, comprising:

measuring means for assigning priority to a first level con-

taining information which has been stored longer than that in any other level; and



control means coupled to said measuring means and to said multi-level stack for forwarding the contents of said first level to said at least one destination unit.

4,151,599

MAGNETIC BUBBLE DISPLAY UNITS

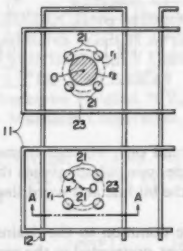
Yoshiki Kikuchi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1978, Ser. No. 884,666

Claims priority, application Japan, Mar. 22, 1977, 52-30473; Oct. 14, 1977, 52-122323

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—3 **9 Claims**



1. A magnetic bubble display unit comprising:

a first set of many folded conductive segments having outward and return lines arranged in parallel with each other in one direction, forming wide-pitch portions and narrow-pitch portions cyclically,

a second set of many folded conductive segments having outward and return lines arranged in parallel with each other in another direction, forming wide-pitch portions and narrow-pitch portions cyclically,

a magnetic bubble material thin film magnetically coupled with said first and second folded conductive segments,

a magnetic bias field generator for holding the magnetic bubbles, and

a set of in-plane anisotropic areas in each of magnetic bubble accommodation spaces defined by overlapped wide-pitch portions of said first and second folded conductive segments, wherein a size of a loop having such shape as to pass through all said in-plane anisotropic areas at the edges nearest to the center of the magnetic bubble accommodation space is not larger than that of the magnetic bubble just before extinguishing.

4,151,600

MAGNETO-RESISTIVE DETECTOR WITH SCANNING BUBBLE DOMAIN

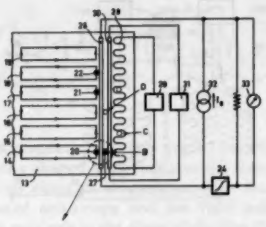
Frederik A. de Jonge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,048

Claims priority, application Netherlands, Sep. 30, 1975, 7511483

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—8 **6 Claims**



1. A magnetoresistive sensing device for selectively reading information-representing magnetization patterns at a plurality of separate information positions, comprising:

a single elongate magneto-resistive sensing element disposed in said magnetization patterns adjacent said information positions;

a plate of magnetizable material having uniaxial anisotropy and including a magnetic bubble domain transport track, which track is disposed substantially parallel to said sensing element;

means which move a first magnetic bubble domain along said track to scan a plurality of successive locations, each of said locations being disposed adjacent a discrete area of said sensing element which is coupled to the magnetic field at one of said information positions, the relative size of said first magnetic bubble domain and the disposition of said locations being such that the magnetic field associated with said first bubble domain influences the resistance of only a corresponding one of said discrete areas from each of said locations; and

means connected to said sensing element which function to detect resistance variations in said sensing element and which distinguish between resistance variations produced in the discrete area which is influenced by the field of said first bubble domain and resistance variations produced in the remainder of said sensing element.

4,151,601

MAGNETIC DOMAIN MEMORY DEVICE WITH AN IMPROVED DETECTOR

Antonius G. H. Verhulst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1977, Ser. No. 827,854

Claims priority, application Netherlands, Sep. 10, 1976, 7610054

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—8 **6 Claims**

1. A magnetic bubble domain memory comprising:

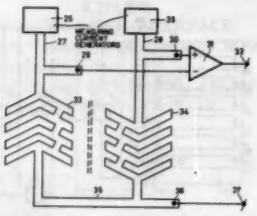
a layer of magnetic material in which magnetic bubble domains can be propogated, including a bubble domain guide structure on said layer which comprises discrete magnetic elements, and a first magnetoresistive detector;

a bias field generator which produces a bias magnetic field directed transversely to said layer which sustains the magnetic bubble domains in said layer; and

a rotary magnetic field generator which produces a rotary magnetic field which drives magnetic bubble domains along said bubble domain guide structure;

said first magnetoresistive detector comprising a connected

magnetoresistive element comprising a plurality of chevron elements composed of magnetoresistive material, each chevron element having a first end portion, a center portion, and a second end portion, the respective center portions of said chevron elements being disposed on an axis transverse to the bubble domain movement at said detector; and a plurality of interlinking elements of said magnetoresistive material connecting said chevron ele-



ments, a majority of said interlinking elements being disposed between said first end portion and said center portion of said chevron elements, said detector functioning to generate a first signal with a comparatively large amplitude and a second signal with a comparatively small amplitude at different instants for each bubble domain passing along said detector, and for each period of the rotary magnetic field.

4,151,602

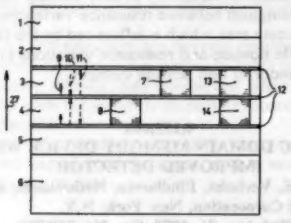
MAGNETIC BUBBLE MULTILAYER ARRANGEMENT

Jan Haisma; Klaas L. L. Van Mierloo; Ulrich E. Enz, and Piet F. Bongers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 564,327, Apr. 2, 1975, abandoned. This application Feb. 17, 1978, Ser. No. 878,822

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—32 **23 Claims**



1. A magnetic bubble device comprising: a non-magnetic substrate layer, a first magnetic layer joined thereto capable of accommodating magnetic bubbles, a second magnetic layer joined to said first magnetic layer capable of accommodating second magnetic bubbles, magnetic field generating means for generating a steady magnetic field component directed substantially transverse to said layers, first generator means having a first transverse position with respect to said layers for serially generating a plurality of magnetic bubbles at said first position in said first magnetic layer, second generator means having a second transverse position with respect to said layers for serially generating a plurality of magnetic bubbles at said second position in said second magnetic layer, said first and second transverse positions having a predetermined fixed spatial disposition relative to each other, control means for sequentially and selectively controlling cooperation between said first and second generating means for upon momentary cooperation generating superposed magnetic bubbles in said first and second magnetic layers which superposed magnetic bubbles are energetically joined through a magnetic compensation wall, whereby non-cooperation between said first and second generator means produces mutually repelling single magnetic bubbles in any of said magnetic layers which are furthermore repelling towards any superposed magnetic bubble arrangement, said device further comprising transport means for generating a relative displacement between any magnetic bubble generated by said first and second generator means in one case and said first and second positions in another case, whereby said magnetic layers each accommodate at least two magnetic crystalline sublattices having respective first and second complementary magnetizations which are directed substantially in opposition with each other, said device further comprising detector means for selectively detecting single or superposed magnetic bubbles, and magnetic bubble annihilator means having a predetermined third position and operative for serially annihilating any single magnetic bubble or superposed magnetic bubble appearing at said third position.

4,151,603

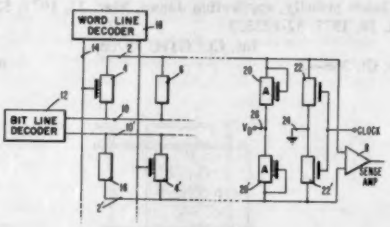
PRECHARGED FET ROS ARRAY

Leo A. Gladstein, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,353

Int. Cl.[2] G11C *17/00, 7/00*

U.S. Cl. 365—104 **4 Claims**



1. An improved read only storage memory circuit of the precharged sense node type, which avoids the problem of race conditions between the bit line and word line signals, comprising:

an array drain line common to the drains of a plurality of FET array devices, connected as the sense node to a sense amplifier;

an array source line common to the sources of said plurality of FET array devices, connected to a bit line signal source;

a word line connected to the gate of one of said plurality of FET array devices when that one device represents a first binary value to be stored and which is not connected to the gate of another one of said plurality of FET array devices when that other one device represents a second binary value to be stored, connected to a word line signal source;

said one FET array device remaining nonconductive if only said bit line or if only said word line has an on signal, said one FET array device becoming conductive when both said bit line and said word line have on signals; a current source connected to said array drain line, for charging said array drain line afer said bit line signal source and word line signal source have issued valid signals;

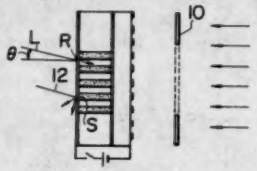
whereby the voltage of said array drain line will be detected by the sense amplifier to not increase as rapidly when said one FET array device is conductive than when said other FET array device is nonconductive.

4,151,604

IMAGE STORAGE AND OPTICAL READ-OUT DEVICE HAVING STRIPED ELECTRODES

Mutsuo Takenouchi, Isehara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 806,130
Claims priority, application Japan, Jun. 11, 1976, 51-67772
Int. Cl.[2] G11C *11/22, 13/04*
U.S. Cl. 365—109 2 Claims



1. In an image storage-reproduction type recording element including a non-conductive mirror layer and a photoconductive layer successively overlying one surface of a thin ceramic plate in which adjacent ferroelectric and antiferroelectric phases can coexist, a first transparent electrode overlying said photoconductive layer, and a second transparent electrode overlying the other surface of said thin ceramic plate, said element of the type in which an area of said first transparent electrode illuminated by a light beam will be represented by a ferroelectric region in said ceramic, the improvement characterized by:

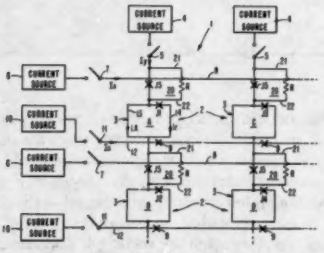
said first transparent electrode being formed in a striped pattern such that said light beam will span at least two stripe electrodes and said illuminated area will be represented by a plurality of adjacent ferroelectric and antiferroelectric regions in said ceramic plate.

4,151,605

SUPERCONDUCTING MEMORY ARRAY CONFIGURATIONS WHICH AVOID SPURIOUS HALF-SELECT CONDITION IN UNSELECTED CELLS OF THE ARRAY

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, New York 10504

Filed Nov. 22, 1977, Ser. No. 853,955
Int. Cl.[2] G11C *11/44*
U.S. Cl. 365—162 24 Claims



1. A superconductive random access memory comprising:

a plurality of memory cells arranged in array fashion wherein information is stored in individual memory cells in the form of at least a single circulating current,

means coupled to a plurality of portions of said memory cells for applying an enabling current to one of said portions which includes a selected one of said memory cells, and

means connected to said memory cells for applying at least a control magnetic field to only said selected one of said memory cells simultaneously with said enabling current to store information in said selected one of said memory cells.

4,151,606

BLOCH-LINE MEMORY SYSTEM

Ernest J. Torok, Saint Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 29, 1977, Ser. No. 865,468
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—172 5 Claims

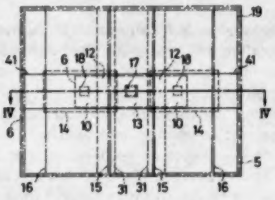
4. A thin magnetic film data track, the edges of its planar contour being shaped with indentations forming narrow and wide portions along its longitudinal such that the sum of the shape induced anisotropy and the field induced anisotropy provides an easy axis in the plane of the film that is perpendicular to the longitudinal axis of the data track and in which the center of the narrow portions of the data track is vertically displaced from the center of the wide portions of the data track.

4,151,607

SEMICONDUCTOR MEMORY DEVICE

Mitsumasa Koyanagi, and Kikuji Sato, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 5, 1977, Ser. No. 812,907
Claims priority, application Japan, Jul. 5, 1976, 51/78967; Mar. 4, 1977, 52/22685
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—174 3 Claims



1. A semiconductor memory device comprising:

a semiconductor substrate;

a plurality of memory cells arranged in matrix form on one surface of said semiconductor substrate, each of said memory cells comprising:

a source region, a gate region, and a drain region, which are provided in a surface portion of said semiconductor substrate,

a gate insulating film provided on the gate region,

a first conductive substrate provided opposite said gate region on the gate insulating film to serve as a gate electrode,

a first insulating film disposed on said first conductive substance, and

at least one storage capacitance unit comprising a second conductive substance which is in contact with either said source region or said drain region, a part of said second conductive substance being superimposed on said first conductive substance through said first insulating film,

a second insulating film provided on said second conductive substance, and

a third conductive substance provided on said second insulating film;

a third insulating film disposed on said memory cells;

a data line disposed on said third insulating film and connecting in succession through a contact hole formed through said third insulating film either the source region or the drain region which is not in contact with said second conductive substance, with the corresponding source or drain region of adjacent memory cells belonging to the same column; and

a word line connecting said first conductive substance in succession with the corresponding region of adjacent memory cells belonging to the same row.

4,151,608

CIRCUIT ARRANGEMENT FOR SUPPRESSING MAGNETIC INDUCTION NOISE DUE TO AN ALTERNATING MAGNETIC FIELD

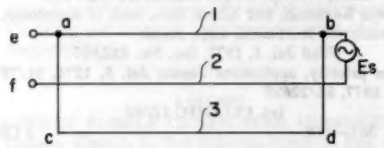
Nobuo Saito, Mitaka; Takashi Toyooka, Tokyo; Hirofumi Ohta, Mobara, and Atsushi Asano, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 655,140

Claims priority, application Japan, Feb. 5, 1975, 50-14413

Int. Cl.[2] G11C *7/02*

U.S. Cl. 365—214 **9 Claims**



1. A circuit arrangement for suppressing magnetic induction noise due to an alternating magnetic field comprising:

first and second parallel conductors transmitting signals from a signal source to a signal receiver; and

a third conductor which is coplanar with and parallel to said first and second conductors and which is interconnected to said first conductor at both extremities thereof, the three conductors being so disposed that said first and third conductors are symmetric with respect to the center line of the second conductor.

4,151,609

FIRST IN FIRST OUT (FIFO) MEMORY

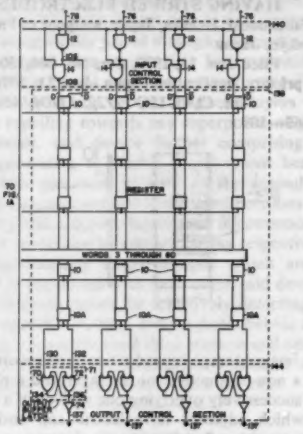
William E. Moss, Sunnyvale, Calif., assignor to Monolithic Memories, Inc., Sunnyvale, Calif.

Filed Oct. 11, 1977, Ser. No. 840,827

Int. Cl.[2] G11C *13/00, 21/00*

U.S. Cl. 365—221 **14 Claims**

1. A First in First Out bipolar memory system comprising, in combination, a plurality of bipolar registers for storing words of information, word transfer means coupled to said plurality of registers for shifting the contents of said plurality of registers to the next sequential register, said word transfer means including word control means for indicating (a) when a register can accept new information, (b) when a register is presently storing information, and (c) when a register is transferring information, bipolar input control means coupled to the first of said plurality of registers for controlling entry of said words into said plurality of registers and preventing entry of new information into the first register when said first register is



already storing information, and bipolar output control means coupled to the last of said plurality of registers.

4,151,610

HIGH DENSITY SEMICONDUCTOR MEMORY DEVICE FORMED IN A WELL AND HAVING MORE THAN ONE CAPACITOR

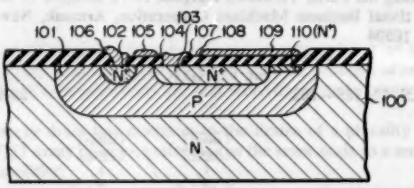
Yasoji Suzuki, Ayase, and Kiyofumi Ochii, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 13, 1977, Ser. No. 777,664

Claims priority, application Japan, Mar. 16, 1976, 51-28522; Mar. 16, 1976, 51-28523

Int. Cl.[2] G11C *11/24, 11/40, 7/00*

U.S. Cl. 365—222 **10 Claims**



2. A semiconductor memory device comprising at least one memory cell including a semiconductor substrate of one conductivity type; a semiconductor region formed in the surface of the semiconductor substrate with the opposite conductivity type to, and at a higher impurity concentration than, the semiconductor substrate; source and drain regions of said one conductivity type formed in the surface of said semiconductor region and having a higher impurity concentration than the semiconductor substrate; a gate insulation layer formed between the source and drain regions; an insulation layer formed partly on a selected one of the source and drain regions; and an electrically conductive layer mounted on said insulation layer over said selected one of the source and drain regions, wherein a first capacitor is formed of the conductive layer and said selected one of the source and drain regions serving as the facing electrodes of the capacitor and a second capacitor is formed in the junction of said semiconductor region and the selected one of the source and drain regions.

4,151,611

POWER SUPPLY CONTROL SYSTEM FOR MEMORY SYSTEMS

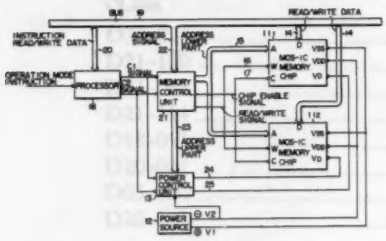
Mutsuo Sugawara, Yokosuka, and Keiji Namimoto, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,081

Claims priority, application Japan, Mar. 26, 1976, 51-33182; Mar. 26, 1976, 51-33183

Int. Cl.[2] G11C 7/00

U.S. Cl. 365—227 3 Claims



3. A memory system comprising:

a plurality of semiconductor memory chips each having address terminals to which an address signal is applied to designate a memory location therein, data terminals to which is applied a data signal which is written into the designated memory location or is read out of the designated memory location, a chip enable terminal to which is applied a chip enable signal during which a read operation or write operation is executed, a memory content holding power supply terminal to which a power supply voltage is normally applied to hold memorized contents of said memory chips and a read/write power supply terminal to which a power supply voltage necessary for read/write operation is applied;

a power supply connected to said memory content holding power supply terminal of each of said memory chips;

bus means for transferring an address signal including a first part signal designating a memory location of said memory chips and a second part signal for selecting one of said memory chips;

processor means for providing first and second data transfer control signals each taking successively a first voltage level and a second voltage level and specifying a first memory addressing state in which the first and second control signals are at the first voltages level, a second read/write operation execution state in which one of the first and second control signals is at the first voltage level and the other is at the second voltage level dependent on the read or write operation, and a third idle state in which the first and second control signals are at the second voltage level, said states following in succession during a read or write cycle;

means responsive to the first state of the first and second control signals to apply the first part signal of the address signal to said address terminals of each of said memory chips, responsive to the second state of the control signals and the second part signal of the address signal to apply the chip enable signal to said chip enable terminal of a memory chip selected by the second part signal of the address signal, and to the second state of the control signals to apply the read/write control signal to said read/write control terminal of each of said memory chips; and

means responsive to the first and second states of the first and second control signals to couple said power supply to said read/write power supply terminal of each of said memory chips.

DESIGN PATENTS

GRANTED APR. 24, 1979

ERRATA

For CLASS	See PATENT NO.
D30-014	251,688
D21-130	251,689
D21-063	251,690
D21-114	251,691
D18-013	251,692
D20-031	251,693
D03-030	251,694
D20-019	251,695

DESIGN PATENTS

GRANTED APR. 24, 1979

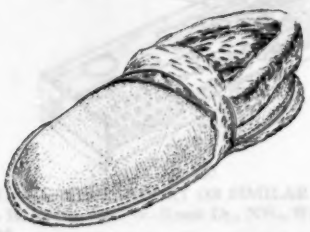
ERRATA

Cl.	No.
Class	Patent No.
D30-014	239,038
D21-130	241,040
D21-083	241,050
D21-114	241,051
D18-027	241,052
D25-021	241,053
D20-030	241,054
D26-019	241,055

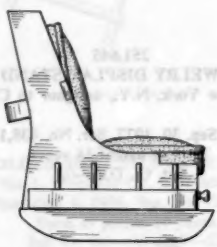
DESIGNS

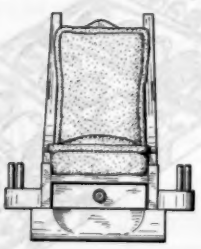
APRIL 24, 1979

251,636
SLIPPER
Margot L. Chapman; Patricia A. Brown, both of Chicago, and Ingrid Kostrubala, Evanston, all of Ill., assignors to Warm Hearts, Inc., Chicago, Ill.
Filed Feb. 11, 1977, Ser. No. 767,895
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—301

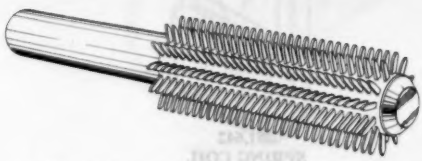


251,637
SEWING CADDY OR THE LIKE
Charles N. Epperson, 5960 S. Lewis, Tulsa, Okla. 74105
Filed Nov. 14, 1977, Ser. No. 851,521
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D3—21



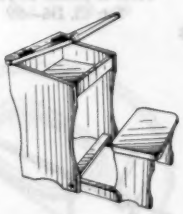


251,638
HAIR BRUSH
Nevenka Ergaver, and Rayko Ergaver, both of Toronto, Canada, assignors to Capella, Inc., Freeport, Bahama Islands
Filed Jun. 7, 1977, Ser. No. 804,420
Claims priority, application Canada, Dec. 8, 1976, 0812761
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



251,639
OTTOMAN
Donald B. Colby, Los Angeles, Calif., assignor to Scott Paper Company, Philadelphia, Pa.
Filed May 6, 1977, Ser. No. 794,637
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

251,640
COMBINED LIFT-LID DESK AND FOLDABLE SEAT THEREFOR
C. M. Hindman, 1315 Metro Dr., Apt. 133, Carrollton, Tex. 75006
Filed Jul. 15, 1976, Ser. No. 705,541
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—44

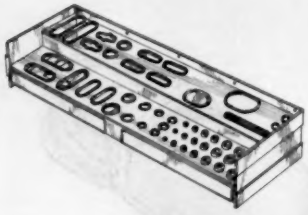


251,641
SEAT
Luis M. Chacon, P.O. Box 920, San Jose, Costa Rica
Filed Jan. 24, 1977, Ser. No. 761,792
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

251,642
SPRING COIL
Henry R. Ramsey, Dudley, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.
Filed Jan. 31, 1977, Ser. No. 763,855
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—84

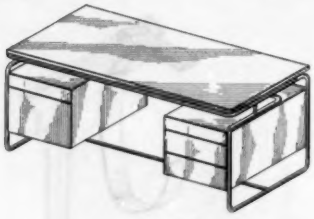
251,643
FOLDABLE SUPPORT STAND FOR A DESK CALCULATOR OR SIMILAR ARTICLE
Tracy H. Forman, 51 Summit Rd., Parsippany, N.J. 07054; Arthur E. Lawida, 28 Gabriel Way, Westwood, N.J. 07675, and Nat H. Herskowitz, 47 Bannehr St., Oakland, N.J. 07436
Filed Jun. 7, 1976, Ser. No. 693,141
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

251,644
TOOL RACK
Ole S. Ravn, Farum, Denmark, assignor to Stig Ravn A/S, Farum, Denmark
Filed Mar. 6, 1978, Ser. No. 884,040
Claims priority, application Denmark, Sep. 5, 1977, 674/77
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



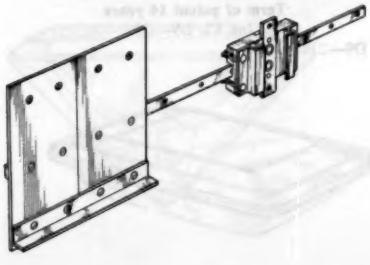
251,645
JEWELRY DISPLAY STAND
Maxine Kelly, New York, N.Y., assignor to Ciani, Inc., New York, N.Y.
Filed Sep. 30, 1977, Ser. No. 838,194
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157

251,646
DESK
Sally S. Walsh, 1955 Richmond Ave., Houston, Tex. 77098
Filed Mar. 16, 1977, Ser. No. 778,111
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

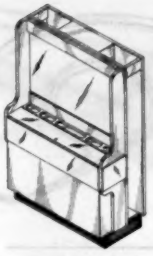


251,647
DUAL EASEL SUPPORT OR SIMILAR ARTICLE
Bonita H. Valien, 8020 W. Beach Dr., NW., Washington, D.C. 20012
Filed May 18, 1977, Ser. No. 798,005
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—180

251,648
HOLDER FOR USE WITH EASELS
Leo Graviner, No. 1, Woodhue Ct., Baltimore, Md. 21207
Filed Oct. 6, 1976, Ser. No. 730,065
Term of patent 14 years
Int. Cl. D6—*06*; D19—*02*
U.S. Cl. D6—191



251,649
PHOTOGRAPHIC FILM DEPOSITORY OR THE LIKE
Jules D. Devin, 309 Ridgebriar Dr., Richardson, Tex. 75080, and Claude J. Sharpless, 7371 E. 82nd Pl., Commerce City, Colo. 80020
Filed Apr. 21, 1978, Ser. No. 899,097
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188

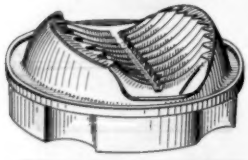


251,650
DISH FOR MICROWAVE BAKING
Louis N. Heller, 741 Blackmer Cir., Sacramento, Calif. 95825
Filed Aug. 22, 1977, Ser. No. 826,886
Term of patent 14 years
Int. Cl. D7—*01, 02*
U.S. Cl. D7—23

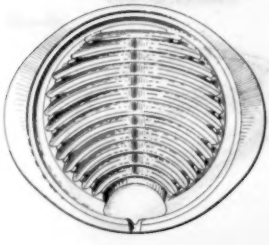
251,651
FOOD TRAY
Michael C. Molloy, Nashville, Tenn., assignor to Aladdin Industries, Incorporated
Filed Apr. 18, 1977, Ser. No. 788,221
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

251,652
FOOD TRAY
Michael C. Molloy, Nashville, Tenn., assignor to Aladdin Industries, Incorporated
Filed Apr. 18, 1977, Ser. No. 788,222
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

251,653
COOKING DISH
Stanley I. Mason, Jr., and Charlotte G. Mason, both of 61 River Rd., Weston, Conn. 06880
Filed Jul. 1, 1977, Ser. No. 812,233
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

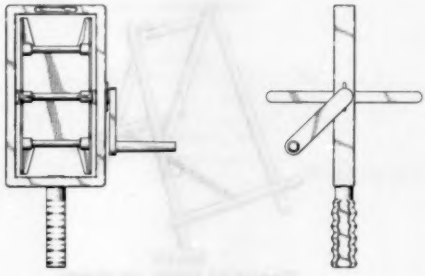


251,654
COOKING DISH
Stanley I. Mason, Jr., and Charlotte G. Mason, both of 61 River Rd., Weston, Conn. 06880
Filed Jul. 1, 1977, Ser. No. 812,397
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—85

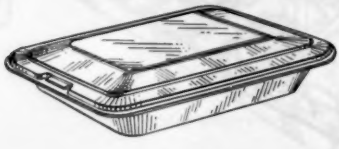


251,655
CUSPIDOR HANDLE
Harold A. Stephenson, 2223 Ridgewood, Irving, Tex. 75062
Filed Mar. 23, 1977, Ser. No. 780,655
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D7—190

251,656
REEL FOR WINDING LINE
John F. McClure, 810 Peach Tree, Rochester, Mich. 48063
Filed Aug. 26, 1977, Ser. No. 828,162
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—359



251,657
PACKAGING CONTAINER FOR FOOD
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc.
Filed Jan. 28, 1977, Ser. No. 763,303
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

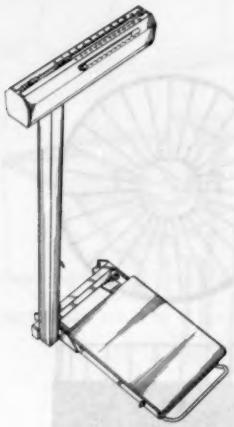


251,658

WEIGHING SCALE

Bengt Björk, Malmö, Sweden, assignor to Lindells Vagfabrik Aktiebolag, Lund, Sweden

Filed Jan. 10, 1977, Ser. No. 758,319
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—93



251,659

DIAMOND

Henry Grossbard, 552 Beach 132 St., Belle Harbor, N.Y. 11694

Filed Nov. 1, 1976, Ser. No. 737,895
The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—90

251,660

OPEN HOOD FOR A GONDOLA CAR

Donald S. Low, 804 - 2075 Comox St., Vancouver, British Columbia, Canada

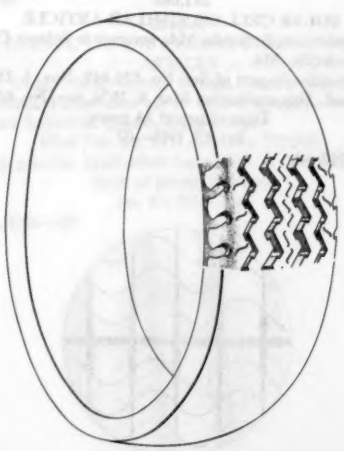
Filed Jul. 13, 1976, Ser. No. 704,785
Claims priority, application Canada, Jan. 26, 1976, 2601762
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—43

251,661

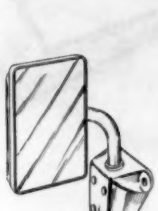
PNEUMATIC TIRE TREAD AND BUTTRESS

Karl A. Grosch, Roetgen; Paul H. Moitzheim; Gert Schloesser, both of Aachen, all of Fed. Rep. of Germany, and Daniel J. M. Hensgens, Ubach-Overworms, Netherlands, assignors to Uniroyal GmbH

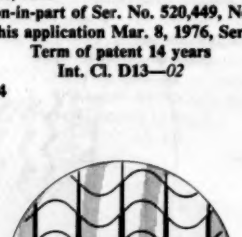
Filed Apr. 5, 1978, Ser. No. 893,559
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



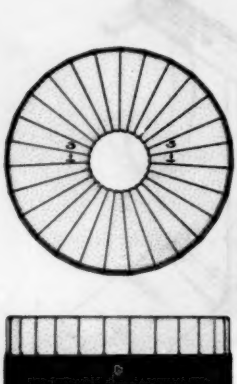
251,662
COMBINED VEHICLE REARVIEW MIRROR AND MOUNTING BRACKET
Richard D. Hutchinson, Jr., Holland; Wayne Vandenbrink, and Philip D. Stegenga, both of West Olive, all of Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.
Filed Aug. 5, 1977, Ser. No. 822,086
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187



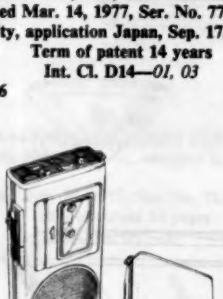
251,663
SOLAR CELL OR SIMILAR ARTICLE
Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.
Continuation-in-part of Ser. No. 520,449, Nov. 4, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,540
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



251,664
ELECTROSTATIC RADIATOR
Norman Dusanek, 8116 Deering Ave., Canoga Park, Calif. 91304
Filed May 23, 1977, Ser. No. 799,142
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30



251,665
TAPE RECORDER
Takemi Ebata, Kyoto; Kunishige Miki, Katano, and Manao Nakamura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza-Kadoma, Japan
Filed Mar. 14, 1977, Ser. No. 777,489
Claims priority, application Japan, Sep. 17, 1976, 51/37177
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—6



251,666

COMBINED CONSOLE AND TABLE FOR ELECTRONIC EQUIPMENT OR SIMILAR ARTICLE

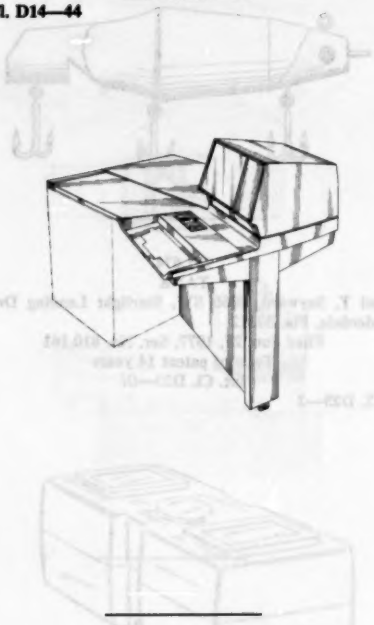
Dennis C. Coon, Acton, Mass., assignor to Honeywell Information Systems Inc.

Filed Apr. 1, 1977, Ser. No. 783,890

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—44



251,667

DIGGER TOOTH

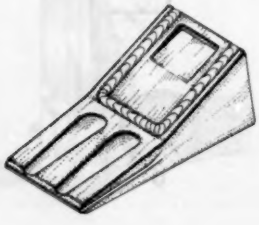
Harland F. Lemcke, Corona, Calif., assignor to Corona Clipper Company, Corona, Calif.

Filed Nov. 9, 1977, Ser. No. 849,845

Term of patent 14 years

Int. Cl.[2] D15—*04*

U.S. Cl. D15—29



251,668

VACUUM CLEANER DUST BAG

Gustaf Å. Åsberg, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jan. 10, 1977, Ser. No. 757,943

Claims priority, application Sweden, Jul. 9, 1976, 76-1430

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D15—61

251,669

LENS BARREL HAVING PLURAL LUGS OR SIMILAR ARTICLE

Hiroshi Ueda, Nara; Kyozo Uesugi, Izumi, and Masakazu Nakanishi, Hashimoto, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

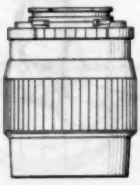
Filed Feb. 22, 1977, Ser. No. 770,960

Claims priority, application Japan, Nov. 2, 1976, 51/43230

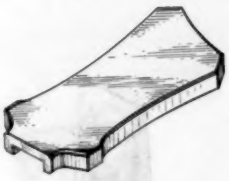
Term of patent 14 years

Int. Cl. D16—*06*

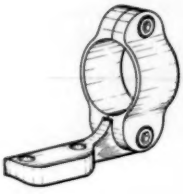
U.S. Cl. D16—49



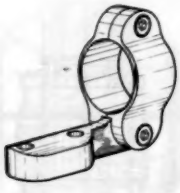
251,670
STRINGED INSTRUMENT HEAD
Emil H. Soika, 2312 E. Grand Ave., Lindenhurst, Ill. 60046, and Robert R. Genc, 117 E. Grove, Mundelein, Ill. 60060
Filed Jun. 20, 1977, Ser. No. 808,236
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



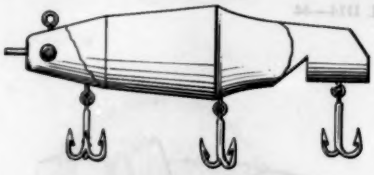
251,671
RIFLESCOPE MOUNT
Daniel L. Bechtel, 4701 Inwood Rd., Fort Worth, Tex. 76109
Filed Jun. 27, 1977, Ser. No. 810,423
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



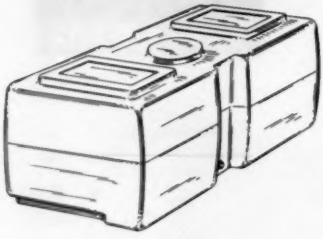
251,672
RIFLESCOPE MOUNT
Daniel L. Bechtel, 4701 Inwood Rd., Fort Worth, Tex. 76109
Filed Jun. 27, 1977, Ser. No. 810,424
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



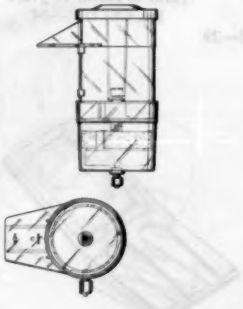
251,673
FISHING LURE
David R. Shelton, 212 W. Virginia Ave., Crewe, Va. 23930
Filed Jun. 24, 1977, Ser. No. 810,009
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



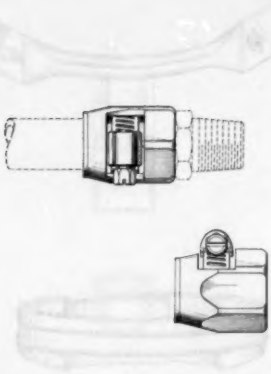
251,674
TANK
Michael T. Sayward, 2060 SW. Starlight Landing Dr., Fort Lauderdale, Fla. 33312
Filed Jun. 27, 1977, Ser. No. 810,161
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



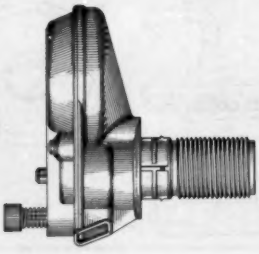
251,675
CHLORINATOR
David W. Kratz, 17 Country Life Acres, St. Louis County, Mo. 63131
Filed Aug. 5, 1977, Ser. No. 824,973
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



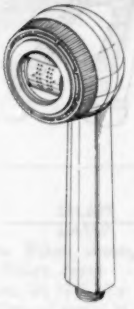
251,676
TERMINAL FITTING FOR A TUBULAR CONDUIT
Robert E. Fouts, 2152 Van Karajan, San Pedro, Calif. 90732
Filed May 16, 1977, Ser. No. 796,962
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44



251,677
FILL VALVE
Dwight N. Johnson, 24656 Shadowfax, El Toro, Calif. 92630
Filed Jun. 23, 1977, Ser. No. 809,383
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



251,678
HAND-HELD SHOWER HEAD
Wong M. Kwan, North Point, Hong Kong, assignor to Well Men Industrial Company, Quarry Bay, Hong Kong
Filed Jun. 8, 1977, Ser. No. 804,734
Claims priority, application United Kingdom, Feb. 25, 1977, 979040/77
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



251,679
SHOWER HEAD
Wong M. Kwan, North Point, Hong Kong, assignor to Well Men Industrial Company, Quarry Bay, Hong Kong
Filed Jun. 8, 1977, Ser. No. 804,800
Claims priority, application United Kingdom, Feb. 25, 1977, 979041/77
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

251,680

HOSE NOZZLE

Donald F. Morgan, Marshall, Mich., assignor to The Citation Companies, Grand Rapids, Mich.

Filed Apr. 17, 1978, Ser. No. 896,924

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—37

251,681

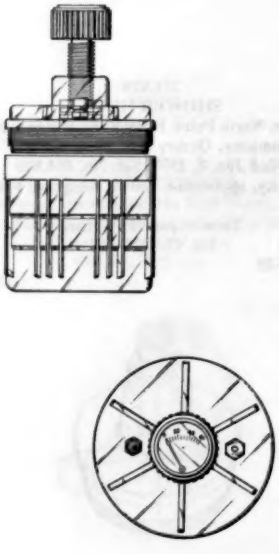
PRESSURE VESSEL FOR CURING PLASTIC DENTURES

John K. Lawler, deceased, late of Gardena, Calif., by Doris Gene Lawler, executrix, 16616 Taylor Ct.; John W. Mitchell, Sr., 1701 W. 168th St., and Kenneth H. Oyama, 1601 W. Redondo Beach Blvd., all of Gardena, Calif. 90247

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—4



251,682

SURGICAL STRAP OR SIMILAR ARTICLE

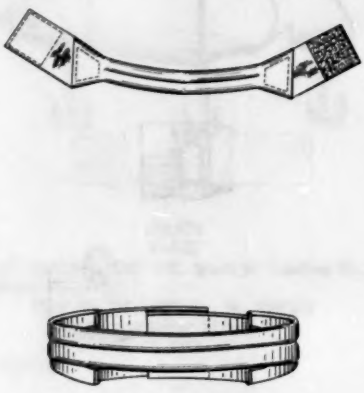
Jack Levine, 70 E. 10th St., Apt. 19L, New York, N.Y. 10003

Filed Mar. 10, 1977, Ser. No. 776,465

Term of patent 14 years

Int. Cl. D24—*04;* D2—*02*

U.S. Cl. D24—64



251,683

PRESSURE VESSEL FOR CURING PLASTIC DENTURES

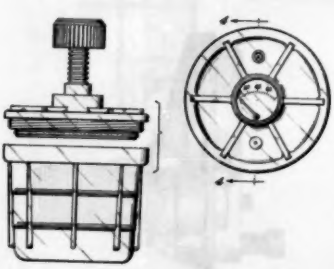
John W. Mitchell, Sr., 1701 W. 168th St.; Kenneth H. Oyama, 1601 W. Redondo Beach Blvd., both of Gardena, Calif. 90247 and John K. Lawler, deceased, late of Gardena, Calif., by Doris Gene Lawler, executrix, 16616 Taylor Ct., Gardena, Calif. 90247

Filed Jan. 23, 1978, Ser. No. 871,515

Term of patent 14 years

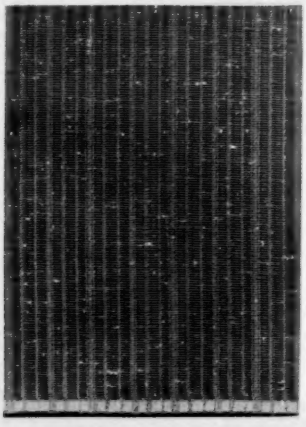
Int. Cl. D24—*02*

U.S. Cl. D24—4

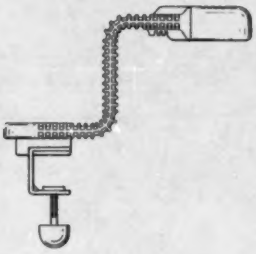


251,684
MOUNTING BRACKET FOR A SPECIMEN CUP
Kenton E. Wood, Somerville, N.J.; Alan G. Hill, Hampshire, and Graham E. Collins, Hampshire, both of England, assignors to Vickers America Medical Corporation, Whitehouse Station, N.J.
Filed Aug. 16, 1976, Ser. No. 714,615
Term of patent 14 years
Int. Cl. D24—*02;* D6—*04;* D8—*08*
U.S. Cl. D24—31

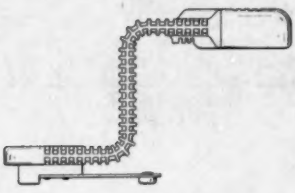
251,685
CURTAIN FABRIC
Peter E. Schroeder, Oberwil bei Brenngarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Dec. 29, 1976, Ser. No. 755,202
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 549
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



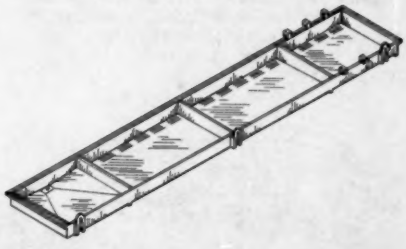
251,686
LAMP
Masayuki Kurokawa, Tokyo, Japan, assignor to Yamagiwa Electric Co. Ltd., Tokyo, Japan
Filed Aug. 18, 1977, Ser. No. 825,811
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



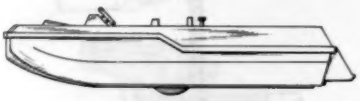
251,687
LAMP
Masayuki Kurokawa, Tokyo, Japan, assignor to Yamagiwa Electric Co. Ltd., Tokyo, Japan
Filed Aug. 18, 1977, Ser. No. 825,813
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



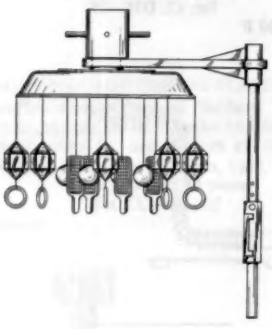
251,688
BIRD FEEDER
Pat G. Kimbrough, III, St. Louis, Mo., assignor to Bird Lovers Products, Inc., St. Louis, Mo.
Filed Apr. 27, 1977, Ser. No. 791,588
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



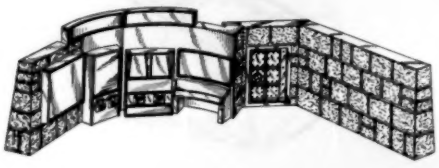
251,689
TOY BOAT
Craig J. McElhaney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1977, Ser. No. 766,446
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—130



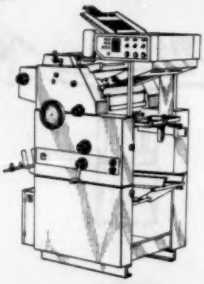
251,690
PHYSICAL THERAPY MOBILE TOY
Arthur L. Lee, 1034 Cameron Rd., Baltimore, Md. 21212
Filed Jun. 6, 1977, Ser. No. 803,911
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—63



251,691
TOY FORTRESS
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,242
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114

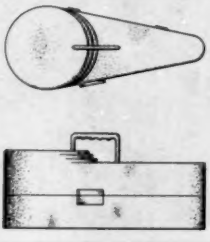


251,692
PRINTING MACHINE
Etsuo Hiraishi, Hiroshima; Masakazu Sakamoto, and Tetsuyuki Doi, both of Fukuyama, all of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Feb. 8, 1977, Ser. No. 766,846
Claims priority, application Japan, Aug. 10, 1976, 51-31545
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13



251,693
FEMALE MANNEQUIN OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 10021
Filed Sep. 23, 1977, Ser. No. 835,992
Term of patent 14 years
Int. Cl. D20—*02*; D21—*01*
U.S. Cl. D20—31

251,694
CARRYING CASE FOR A WEIGHING SCALE
Robert A. Zohn, and Carole Zohn, both of Douglaston, N.Y., assignors to Correct Count Company Inc.
Filed Jul. 11, 1977, Ser. No. 814,789
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—30

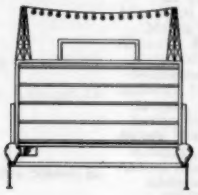


251,695

CHANGEABLE COPY MESSAGE BOARD

Mitchell Miller, and Charles M. Miller, both of Rte. 4, Box 252, Milledgeville, Ga. 31061

Filed Nov. 18, 1977, Ser. No. 852,939
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—19



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TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF APRIL, 1979

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Adams, James W., to American Can Company. Polymer modified cellulose fibers and method of producing. 4,151,130, Cl. 260-17.4GC.

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Herman, Frederick L.; and Dixon, Dale D., 4,151,142, Cl. 260-29.60R.
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Albrecht, Hans P.; Friedrich, Ludwig; and Zimmermann, Frank, to BASF Aktiengesellschaft. Non-glycosidic theophylline-sugar derivatives. 4,151,277, Cl. 424-180.000.

Allan, David E.; and Lewis, William E., to Exxon Research & Engineering Co. Staged slurry hydroconversion process. 4,151,070, Cl. 208-59.000.

Allcock, Harry R.; Allen, Robert W.; and O'Brien, John P., to Research Corporation. Complex or salt of a platinum (II) compound and a nitrogen containing polymer. 4,151,185, Cl. 260-429.00R.

Allen-Bradley Company: *See—*
Struger, Odo J.; Bremenour, Edwin L.; Burns, James F.; and Jerva, Ronald E., 4,151,580, Cl. 361-415.000.

Allen, Paul E., to Logic Devices, Inc. Method for cooling plastic injection mold dies. 4,151,243, Cl. 264-219.000.

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Alvarez, Vincent E.; and Maddox, Lodric L., to Clorox Company, The. Built liquid bleaching compositions. 4,151,104, Cl. 252-99.000.

Alyapkin, Vladimir D.: *See—*
Litovchenko, Sergei S.; and Alyapkin, Vladimir D., 4,150,783, Cl. 235-458.000.

Amano, Kazutoshi; Suehiro, Kazuyasu; Sato, Takehiko; and Ohnishi, Yuuji, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Petrochemical Company Limited. Method of cooling cracked gases of low boiling hydrocarbons. 4,151,217, Cl. 260-683.00R.

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American Gas Association, The: *See*—
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Hamilton, Raymond R., 4,150,623, Cl. 101-466.000.

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Ansar, Lars A. P. Indicator of true wind direction for sail boats. 4,150,491, Cl. 33-349.000.

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Anzenberger, Joseph F., Sr.; and Silvon, Michael P., to Stauffer Chemical Company. Method and composition for controlling foam in non-aqueous fluid systems. 4,151,101, Cl. 252-49.600.

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Baldorossi, Blanche N.; and Baldorossi, Raymond F., 4,150,826, Cl. 273-218.000.

Baldwin, John J., to Merck & Co., Inc. Substituted (3-loweralkylamino-2-R_1O-propoxy)pyridines, antihypertensive compositions and methods containing same. 4,151,284, Cl. 424-263.000.

Balke, George L.; and Jablonski, Edward F., to Arthur G. McKee & Company. Interlocking checker tile. 4,150,717, Cl. 165-9.100.

Ballast-Nedam Groep N.V.: *See*—
Sijthoff, Jan Piet t., 4,150,502, Cl. 37-58.000.

Ballegeer, Jean-Claude: *See*—
Nguyen Huu, Duyet; Ballegeer, Jean-Claude; and Guedj, Richard, 4,151,597, Cl. 364-900.000.

Bambara, Mario; and Cotroneo, Francesco, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for selectively shifting groups of bits for temporary storage in a processor memory of a telephone exchange. 4,151,375, Cl. 179-18.0ES.

Banerjea, Tara N.; and Ringe, Stephen J., to Fruehauf Corporation. Automatic supports. 4,150,840, Cl. 280-429.000.

Bangor Punta Operations, Inc.: *See*—
Curran, Roger, 4,150,656, Cl. 124-74.000.

Barlis, Glenn A.: *See*—
Coffta, Joseph A.; Heim, William P.; Wilsdon, Thomas A.; and Barlis, Glenn A., 4,151,384, Cl. 200-153.00R.

Barlow, Wayne K.; and Schimmelpfennig, Howard G., to Wescor, Inc. Osmometer for colloid osmometry. 4,150,564, Cl. 73-64.300.

Barnes, Bruce P.: *See*—
Rosenthal, Arnold J.; Forschirm, Alex S.; and Barnes, Bruce P., 4,151,322, Cl. 428-254.000.

Barnett, David A. J. Economic board game. 4,150,827, Cl. 273-256.000.

Baron, George B., to Dresser Industries, Inc. Load equalizing bail assembly. 4,150,812, Cl. 254-190.00R.

Barral, Robert: *See*—
Bachelard, Roland; Barral, Robert; Lamalle, Maurice; and Koeppel, Robert, 4,151,000, Cl. 106-109.000.

Barron, Mark B.; and Butler, Walter J., to United States of America, Air Force. Junction-storage JFET bucket-brigade structure. 4,151,539, Cl. 357-24.000.

Barry, James W.; and Dickson, Andrew C., to Owens-Illinois, Inc. Method for blow molding plastic articles. 4,151,250, Cl. 264-532.000.

Bartel, William J.: *See*—
Cha, Chang Y.; and Bartel, William J., 4,150,722, Cl. 166-251.000.

Barthel, Thomas C.: *See*—
Menken, John D.; Brastad, Brian A.; and Barthel, Thomas C., 4,151,513, Cl. 340-206.000.

Barzilai, Giorgio; Maltese, Paolo; and Ottavi, Cesare M. Hollow-space cell and method for its manufacture. 4,150,878, Cl. 350-344.000.

BASF Aktiengesellschaft: *See*—
Albrecht, Hans P.; Friedrich, Ludwig; and Zimmermann, Frank, 4,151,277, Cl. 424-180.000.
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,150,943, Cl. 8-41.00R.
Neuberg, Rainer; Penzien, Klaus; and Matthies, Hans G., 4,151,223, Cl. 260-873.000.
Perner, Johannes; Frey, Guenter; Helfert, Herbert; and Fikentscher, Rolf, 4,151,127, Cl. 252-542.000.
Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, 4,150,719, Cl. 165-140.000.

BASF Wyandotte Corporation: *See*—
Kan, Peter T.; and Cenker, Moses, 4,151,334, Cl. 521-105.000.
Nassry, Assadullah; and Maxwell, Jerrold F., 4,151,099, Cl. 252-32.70E.

Bass, Sidney: *See*—
Bailey, Charles E.; Bass, Sidney; and Edmisson, Russell C., 4,150,903, Cl. 400-95.000.

Bastian, James W.: *See*—
Caulin, Francine B.; and Bastian, James W., 4,151,276, Cl. 424-111.000.

Batteas, J. D.: *See*—
Fitts, Fred E., III; and Batteas, J. D., 4,151,372, Cl. 179-7.10R.

Battelle Memorial Institute: *See*—
Cuenoud, Gerard; Farkas, Rudolf; Revillet, Georges; and Sanz, Manuel, 4,150,922, Cl. 417-45.000.
Ligones, Hubert, 4,150,532, Cl. 57-263.000.

Bauer, James J.; and Sagaser, Thomas M., to Clark Equipment Company. Method of manufacturing an overhead guard for a skid steer loader. 4,150,474, Cl. 29-463.000.

Baugh, Robert E.: *See*—
Lafleur, Alonzo D.; Creehan, John T.; and Baugh, Robert E., 4,150,952, Cl. 23-301.000.

Baur, Rudolf, to Swiss Aluminium Ltd. Synthetic bearing lubricant. 4,151,102, Cl. 252-56.00R.

Bausch & Lomb, Inc.: *See*—
Kenessey, Bela, 4,151,418, Cl. 250-442.000.

Bautze, Jeff. Simulated stereoscopic television projection system. 4,151,549, Cl. 358-3.000.

Baxter Travenol Laboratories, Inc.: *See*—
Wolf, Ludwig, Jr.; and Carpenter, Walter L., 4,151,088, Cl. 210-180.000.

Bayard, Michel L., to Texas Instruments Incorporated. Solid dry electrochromic display. 4,150,879, Cl. 350-357.000.

Bayer Aktiengesellschaft: *See*—
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Kaspers, Helmut, 4,151,287, Cl. 424-269.000.
Lindner, Christian; Korte, Siegfried; El Sayed, Aziz; and Suling, Carlhans, 4,151,228, Cl. 260-898.000.
Lurssen, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,150,967, Cl. 71-92.000.
Merz, Walter, 4,151,355, Cl. 544-182.000.
Rasp, Christian; and Scharfe, Gerhard, 4,151,262, Cl. 423-240.000.
Sackmann, Gunter; Kolb, Gunter; Fischer, Heinz; and Muller, Friedhelm, 4,151,336, Cl. 526-15.000.

Bazin, Lucas J., to RCA Corporation. Automatic cable equalizer circuit. 4,151,490, Cl. 333-16.000.

BBC Brown, Boveri & Company, Limited: *See*—
Klein, Erwin; Henke, Arno; and Zink, Hans, 4,151,548, Cl. 357-82.000.

Beale, David W. B., to Marwin (Holdings) Limited. Heat exchange units. 4,151,399, Cl. 219-385.000.

Beatrice Foods Co.: *See*—
Ziccarelli, Salvatore F.; and Noznick, Peter P., 4,151,308, Cl. 426-613.000.

Bebbs, Joseph F., Jr.: *See*—
Osborne, J. Scott, Jr.; Hartung, Homer A.; and Bebbs, Joseph F., Jr., 4,150,677, Cl. 131-8.00R.

Bechtel, Jon H.: *See*—
Hayes, Thomas E.; Emmons, Robert E.; and Bechtel, Jon H., 4,150,571, Cl. 73-336.500.

Beck, Jack: *See*—
Kaufman, Edward; Picciotto, Frank; and Beck, Jack, 4,151,382, Cl. 200-61.710.

Beck, William P.; and Carr, Francis L., to Sunbeam Corporation. Modular cutter assembly for an electric dry shaver. 4,150,482, Cl. 30-43.900.

Becka, Michael M., to International Shoe Machine Corporation. Upper molding and flanging machine. 4,150,454, Cl. 12-53.500.

Becker, Mitchell; and Sachs, Howard M., to Halcon Research and Development Corporation. Recovery of alkylene glycols by azeotropic distillation. 4,151,048, Cl. 203-6.000.

Beckman Instruments, Inc.: *See*—
Aime, Clement P.; and Horrocks, Donald L., 4,151,412, Cl. 250-328.000.

Beckman, Robert P. Bowling ball assembly. 4,150,822, Cl. 273-63.00B.

Becton, Dickinson and Company: *See*—
Riuli, Arduino E.; and Kopacz, Bernard F., 4,150,845, Cl. 285-81.000.

Beehive International: *See*—
Price, Edward G., 4,151,426, Cl. 307-141.000.

Behnke, Edward R., to Columbus McKinnon Corporation. Chain wear inspection gauge. 4,150,488, Cl. 33-168.00R.

Belhomme, Charles J. G.: *See*—
Van Bokestal, Andre M. A.; and Belhomme, Charles J. G., 4,151,401, Cl. 219-508.000.

Belko, Raymond P.; and Huss, Robert C., to United States of America, Army. Rotor blade tipweight assembly. 4,150,920, Cl. 416-145.000.

Bell, Harold S., Jr., to United States of America, Energy. Solids feeder apparatus. 4,150,759, Cl. 214-187.000.

Bell & Howell Company: *See*—
Filipovich, Danny, 4,150,888, Cl. 354-25.000.

Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Current control system for electrical discharge machining apparatus. 4,151,388, Cl. 219-69.00C.

Bell, Robert L., to Kavlico Corporation. Capacitive pressure transducer. 4,151,578, Cl. 361-283.000.

Bell Telephone Laboratories, Incorporated: *See*—
Kibler, Lynden U., 4,151,463, Cl. 324-82.000.
Levinstein, Hyman J.; and Sinha, Ashok K., 4,151,007, Cl. 148-1.500.
Ogureck, Frank M.; and Payne, Richard S., 4,151,009, Cl. 148-1.500.
O'Neill, John F., 4,151,516, Cl. 340-347.0CC.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Butyramides and butyrates. 4,151,296, Cl. 424-298.000.

Bellini, Giorgio, to Zilli & Bellini S.r.l. Continuous cycle destoning and halving machine, particularly for peaches, apples and similar fruit. 4,150,611, Cl. 99-548.000.

Benejean, Richard, to Alsthom-Atlantique. Regulator system including a model. 4,151,587, Cl. 364-106.000.

Benson, Sidney W.: *See—*
Capelle, Gene A.; Sutton, David G.; and Benson, Sidney W., 4,150,951, Cl. 23-232.00E.

Berends, Emerson R.; and Guntharp, Charles D., to Rockwell International Corporation. Radial arm saw guard. 4,150,598, Cl. 83-478.000.

Berent, John G., to Colt Industries Operating Corp. Circuit means and apparatus for controlling the air-fuel ratio supplied to a combustion engine. 4,150,645, Cl. 123-119.0EC.

Berg, Christoph: *See—*
Knothe, Erich; and Berg, Christoph, 4,150,730, Cl. 177-212.000.

Berger, Eugene L.; and Ringo, Marion M., to General Electric Company. Apparatus and method for down hole vibration spectrum analysis. 4,150,568, Cl. 73-151.000.

Berger, Sidney E., to Union Carbide Corporation. Silicon treated surfaces. 4,151,154, Cl. 260-40.00R.

Berman, Arnold; Mahle, Christoph E.; and Assal, Francois T., to Communications Satellite Corporation. Waveguide switch having four ports and three connecting states. 4,151,489, Cl. 333-103.000.

Bernard, Ronald V. Cable loop connector. 4,150,906, Cl. 403-213.000.

Bernard, Walter J.; and Ross, Sidney D., to Sprague Electric Company. Spacer-electrolyte composite in electrolytic capacitors. 4,151,581, Cl. 361-433.000.

Bernhardt, Wolfgang: *See—*
Heiser, Joachim; and Bernhardt, Wolfgang, 4,150,690, Cl. 137-596.130.

Bertolini, Guglielmo: *See—*
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,151,110, Cl. 252-429.00C.

Betts, Joseph E.; Bruhin, Alfred C.; and Hoeppner, Robert P., to General Electric Company. Flame resistant, insulated multi-conductor electric cable. 4,151,366, Cl. 174-116.000.

Bever, Thomas L.: *See—*
Gutsche, Henry W.; Bever, Thomas L.; and Hepperman, John T., 4,150,912, Cl. 407-31.000.

Bhattacharyya, Rabindra N., to Sigma Chemical Company. Enzyme determination method. 4,151,043, Cl. 195-103.50R.

Bielak, Frank A. Improved elements for dust collector. 4,150,959, Cl. 55-341.0HM.

Bielomatik Leuze & Co.: *See—*
Klingelhoefer, Hannsgeorg; and Mann, Friedrich, 4,151,037, Cl. 156-477.00B.

Bilich, Ida L.: *See—*
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.

Bilogan, Mieczyslaw: *See—*
Woollvin, Geoffrey G.; and Bilogan, Mieczyslaw, 4,151,474, Cl. 328-167.000.

Binks Manufacturing Company: *See—*
Telchuk, Steve E., Jr.; Novota, Rudolph J.; and Ingham, Thomas G., 4,150,605, Cl. 98-115.0SB.

Bish, James R.: *See—*
Atkins, Larry P.; and Bish, James R., 4,150,714, Cl. 164-440.000.

Bisiach, Luciano. Tool holder head, particularly for welding yokes and guns. 4,151,390, Cl. 219-124.100.

Black, James M., to United States of America, National Aeronautics and Space Administration. Voltage regulator for battery power source. 4,151,456, Cl. 323-22.00T.

Blank, Werner J.; and Layman, Ralph E., to American Cyanamid Company. Surfactant-free polymer emulsion coating composition and method for preparing same. 4,151,143, Cl. 260-29.6RW.

Blanton, James R. Well pilot valve assembly. 4,150,687, Cl. 137-458.000.

Blazey, Richard N.: *See—*
Howe, Dennis G.; Blazey, Richard N.; and Owens, James C., 4,150,880, Cl. 350-358.000.

Blissett, Michael J.: *See—*
Renshaw, Edward J.; and Blissett, Michael J., 4,150,938, Cl. 431-67.000.

Blochl, Hanns: *See—*
Schnall, Gunther; Schlick, Erich; and Blochl, Hanns, 4,150,892, Cl. 355-3.0DD.

Blomeyer, Earle B.; Watson, William O.; and Richardson, Charles T., Jr., to Gladwin, Inc. Post mounted public telephone. 4,151,380, Cl. 179-148.00R.

Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, to Bobertag und Hausler GmbH; and Gehorschutzcenter Wilhelm und Claus-Dieter Harms GmbH. Apparatus for the chip-free manufacture of axially symmetrical solid bodies of various diameters along their longitudinal extension, made of a soft resilient plastics material. 4,150,934, Cl. 425-305.100.

Bobertag und Hausler GmbH: *See—*
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Bobst-Champlain, Inc.: *See—*
Stern, Nathan, 4,150,495, Cl. 34-54.000.
Stern, Nathan, 4,151,594, Cl. 364-400.000.

Bochmann, Carl E., to Hedstrom Co. Motorized swing. 4,150,820, Cl. 272-86.000.

Bock, Jan: *See—*
Duvdevani, Ilan; and Bock, Jan, 4,151,137, Cl. 260-23.50A.

Boehringer Mannheim GmbH: *See—*
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,348, Cl. 536-27.000.
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,349, Cl. 536-28.000.
Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased; Schaumann, Wolfgang; and Stegmeier, Karlheinz, 4,151,303, Cl. 424-319.000.

Boeing Company, The: *See—*
Evelyn, George B.; and James, Varnell L., 4,150,802, Cl. 244-54.000.

Bogachenko, Alexsey G.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.

Boganowski, David A. Targetable projectile amusement apparatus. 4,150,823, Cl. 273-94.00R.

Bogard, Ralph B.: *See—*
Walker, Bryant H.; and Bogard, Ralph B., 4,150,557, Cl. 72-354.000.

Bolex International SA: *See—*
Reichen, Willi, 4,150,884, Cl. 352-91.00C.

Bolli, Peter; and Asper, Jean-Jacques, to Seaclean SA. Process and plant for hydromechanical recovery of a fluid spread in a thin layer on the surface of another liquid. 4,151,081, Cl. 210-83.000.

Bolton, Jimmie B., to Smith International, Inc. Drill pipe manufacture. 4,151,018, Cl. 148-127.000.

Bonas Machine Company Limited: *See—*
Griffith, John D., 4,150.698, Cl. 139-55.100.

Bond, Orville R. Antenna telescoping tower. 4,151,534, Cl. 343-883.000.

Bondpers, Per-Erik; and Wickstrom, Kjell-Ake, to A-Betong AB. Method of manufacturing a reinforcing cage for a concrete post, and a fixture for carrying out the method. 4,150,475, Cl. 29-469.000.

Bongers, Piet F.: *See—*
Haisma, Jan; Van Mierloo, Klaas L. L.; Enz, Ulrich E.; and Bongers, Piet F., 4,151,602, Cl. 365-32.000.

Boone, Walter S., to Alba-Waldensian, Incorporated. Elbow or heel protector. 4,150,442, Cl. 2-16.000.

Boor, Robert L., Jr.; Keller, Robert A.; and Kesinger, Donald E., to E-Systems, Inc. Self-aligning thermal print head. 4,151,397, Cl. 219-216.000.

Borden, Inc.: *See—*
Hollingsworth, Clinton A., 4,151,259, Cl. 423-167.000.

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin; and Enlow, William P., 4,151,211, Cl. 260-609.00F.

Borregaard Industries Limited: *See—*
Evju, Hans, 4,151,207, Cl. 260-600.00A.

Borsig GmbH: *See—*
Eiermann, Dankwart, 4,150,926, Cl. 418-61.00A.

Boswell, Robert F., Jr.: *See—*
Welstead, William J., Jr.; and Boswell, Robert F., Jr., 4,151,285, Cl. 424-267.000.

Bottasso, Franco; and Manini, Silvio, to Industrie Pirelli, S.p.A. Apparatus for joining the ends of fabric strips. 4,151,038, Cl. 156-507.000.

Bowen, Robert F., to Raytheon Company. Solar collector. 4,150,657, Cl. 126-271.000.

Bowles, John P., to Hydro-Quebec. Series tapping of an HVDC transmission line. 4,151,585, Cl. 363-35.000.

Boyer, Curtis E.; and Mosier, Jacques, to Ford Motor Company. Digital speedometer with index counter control of display. 4,151,466, Cl. 324-166.000.

Boymer, George W.: *See—*
Reid, Kenneth H.; Jarski, William C.; Boymer, George W.; and Heidenreich, Clifford E., 4,150,843, Cl. 280-744.000.

Bozik, John E.: *See—*
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,151,208, Cl. 260-601.00R.

Braathen, Chris R. Method and arrangement for saving energy in preparing hot water for household. 4,150,787, Cl. 237-1.00A.

Brackman, Derek S., to Imperial Chemical Industries Limited. Heat exchanger. 4,150,720, Cl. 165-170.000.

Bradbury, Christopher G.; Buchan, Walter; Kropa, Gomer E.; and Winiarski, Edward J., to Leesona Corporation. Method of cooling pellets. 4,151,241, Cl. 264-142.000.

Bradshaw, Robert S.: *See—*
Lazzarotti, Sebastian J.; Bradshaw, Robert S.; and Hunter, James R., 4,150,743, Cl. 198-460.000.

Braid, Milton, to Mobil Oil Corporation. Novel cobalt thiobis(alkylphenolates) and antioxidant compositions thereof. 4,151,100, Cl. 252-42.700.

Braitinger, Helmut: *See—*
Schneider, Franz; and Braitinger, Helmut, 4,150,616, Cl. 100-35.000.

Brand, Winfried: *See—*
Heller, Heinz; Brand, Winfried; and Gogovic, Peter, 4,150,940, Cl. 431-130.000.

Brandes, Wilhelm: *See—*
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Kaspers, Helmut, 4,151,287, Cl. 424-269.000.

Brandli, Bruno: *See—*
Meyer, Armin; Muller, Jorg; Brandli, Bruno; and Wahli, Robert, 4,150,894, Cl. 355-38.000.

Brandt, Adolf W., to B & H Tool Company, Inc. Ribbon cable extrusion apparatus. 4,150,929, Cl. 425-114.000.

Brandt, Thomas F.; and Netzel, Philip C., to Electric Power Research Institute. Process for shipping and placing flexible transmission line into service. 4,150,480, Cl. 29-628.000.

Branzburg, Elena Z.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.

Brastad, Brian A.: *See*—
Menken, John D.; Brastad, Brian A.; and Barthel, Thomas C., 4,151,513, Cl. 340-206.000.

Breger, Alexandr K.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.

Breglia, Denis R.; Entwistle, Robert J.; Oharek, Frank J.; and Rosendahl, Gottfried R., to United States of America, Navy. Stabilized scene viewing system. 4,150,885, Cl. 352-130.000.

Breikss, Ivars P., to Honeywell Inc. Digital correlator. 4,151,511, Cl. 340-146.200.

Breining, Grant; and Webb, Ronald C., to Dentsply Research & Development Corp. Display rack for eyeglasses. 4,150,752, Cl. 211-13.000.

Bremenour, Edwin L.: *See*—
Struger, Odo J.; Bremenour, Edwin L.; Burns, James F.; and Jerva, Ronald E., 4,151,580, Cl. 361-415.000.

Bremer, Robert C., Jr., to Wallace Murray Corporation. Torsional vibration damper having two part hub. 4,150,587, Cl. 74-574.000.

Brescia, Riccardo. Electronic printer having a single tracing element for tracing out alphanumeric characters. 4,150,902, Cl. 400-17.000.

Breville Holdings Pty. Ltd.: *See*—
McClean, John W., 4,150,609, Cl. 99-372.000.

Brewbaker, James L.; and Sprenger, William A., to Dow Chemical Company, The. Vinyl ester resins containing polyoxyalkylene low profile additives. 4,151,219, Cl. 260-836.000.

Brewer Engineering Laboratories, Inc.: *See*—
Brewer, Given A., 4,150,588, Cl. 74-574.000.

Brewer, Given A., to Brewer Engineering Laboratories, Inc. Dynamic vibration absorber. 4,150,588, Cl. 74-574.000.

Brhel, Alvin A.: *See*—
Williams, Larry J.; and Brhel, Alvin A., 4,150,745, Cl. 206-303.000.

Brilliant Products, Inc.: *See*—
Brunette, Frederick F., 4,150,762, Cl. 220-19.000.

Brinadd Company: *See*—
Jackson, Jack M., 4,151,096, Cl. 252-8.50A.

Briscoe, Harry H. Temperature controlled gable vent. 4,150,785, Cl. 236-49.000.

Bristol-Myers Company: *See*—
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,151,352, Cl. 544-26.000.

British Industrial Plastics Limited: *See*—
Ogden, Dennis H., 4,151,239, Cl. 264-46.600.

Britt, Edward J.: *See*—
Fitzpatrick, Gary O.; and Britt, Edward J., 4,151,438, Cl. 310-306.000.

Britten, George C. Core rod construction for blow-molding apparatus. 4,150,689, Cl. 137-595.000.

Britton, Thomas C.: *See*—
Trepanier, Donald L.; and Britton, Thomas C., 4,151,166, Cl. 260-306.70T.

Brobeck, William M., to Electric Power Research Institute, Inc. Rotor ring for inertial energy storage rotor. 4,150,582, Cl. 74-572.000.

Broken Hill Proprietary Company, Limited, The: *See*—
Debenham, Michael, 4,151,314, Cl. 427-239.000.
Kemlo, Kenneth G., 4,150,974, Cl. 75-60.000.

Bronikowski, John C.: *See*—
Williams, Maurice A.; Horn, Robert E.; and Bronikowski, John C., 4,151,306, Cl. 426-456.000.

Brooks, Richard L.: *See*—
United States of America, National Aeronautics and Space Administration; and Brooks, Richard L., 4,151,086, Cl. 210-108.000.

Brown, Dwight C. Adjustable length strip fastener. 4,150,463, Cl. 24-16.0PB.

Brown, Jack; Herr, John A.; Peterson, Wesley R.; and Wurst, John W., to Singer Company, The. Integrated motor controller for sewing machines. 4,150,634, Cl. 112-275.000.

Brown, Kevan: *See*—
Appleton, Richard A.; and Brown, Kevan, 4,151,179, Cl. 260-345.200.

Brown Manufacturing Company: *See*—
Brown, Russell L.; and Burton, Charles M., 4,151,408, Cl. 250-203.00R.

Brown, Russell L.; and Burton, Charles M., to Brown Manufacturing Company. Sun tracking control system. 4,151,408, Cl. 250-203.00R.

Brugger, Gottfried. Process for applying a coating to a centrifugal casting mold. 4,150,709, Cl. 164-72.000.

Bruhin, Alfred C.: *See*—
Betts, Joseph E.; Bruhin, Alfred C.; and Hoeppner, Robert P., 4,151,366, Cl. 174-116.000.

Brummer, Friedrich, to ESBE Plastics Dinkelsbuhl Brummer K.G. Apparatus and method for manufacturing a plastic container having printed paper insert. 4,151,032, Cl. 156-215.000.

Brunette, Frederick F., to Brilliant Products, Inc. Merchandising bin. 4,150,762, Cl. 220-19.000.

Brush, Donald C., to Sherwood Medical Industries Inc. Tube holder for blood collection tubes of different sizes. 4,150,666, Cl. 128-2.00F.

Brustmann, Herbert: *See*—
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,348, Cl. 536-27.000.
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,349, Cl. 536-28.000.

Bruzzone, Mario: *See*—
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,151,110, Cl. 252-429.00C.

Buchan, Walter: *See*—
Bradbury, Christopher G.; Buchan, Walter; Kropa, Gomer E.; and Winiarski, Edward J., 4,151,241, Cl. 264-142.000.

Buchel, Karl Heinz: *See*—
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Kaspers, Helmut, 4,151,287, Cl. 424-269.000.

Buckley, Bruce S. Apparatus for preventing high temperatures in a glazed solar collector. 4,150,659, Cl. 126-270.000.

Buckley, Donald J.: *See*—
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,151,343, Cl. 526-308.000.

Buescher, William E., to GTE Sylvania Incorporated. Cathode heater assembly for electron discharge device. 4,151,440, Cl. 313-340.000.

Buess, Paul L.: *See*—
Kongelka, Robert M.; and Buess, Paul L., 4,151,467, Cl. 325-15.000.

Bugaut, Andree: *See*—
Lang, Gerard; and Bugaut, Andree, 4,151,162, Cl. 260-158.000.

Buglione, Victor A. Tool box appliance. 4,150,746, Cl. 206-372.000.

Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, to Thyssen Aktiengesellschaft vorm. Augus Thyssen-Hutte. Cooling element for a metallurgical furnace. 4,150,818, Cl. 266-193.000.

Buhler, Helmut: *See*—
Fock, Jurgen; and Buhler, Helmut, 4,151,315, Cl. 427-258.000.

Bumgardner, Donald L.: *See*—
Schreiber, James N.; and Bumgardner, Donald L., 4,151,564, Cl. 360-2.000.

Bundy, Gordon L., to Upjohn Company, The. Bioprecursors of 9-deoxy-6,9α-nitrilo-PGF_1. 4,151,176, Cl. 260-326.270.

Bundy, Gordon L., to Upjohn Company, The. 2-Decarboxy-2-alkylcarbonyl-3,7-inter-m-phenylene-3-oxa-4,5,6-trinor-9-deoxy-9,10-didehydro-PGD_1compounds. 4,151,206, Cl. 260-590.00C.

Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. 11-Deoxy-17-phenyl-13,14-dihydro-PGE_2 compounds. 4,151,359, Cl. 560-53.000.

Buning, Robert, to Dynamit Nobel Aktiengesellschaft. Method for the modification of polyvinylidene fluoride. 4,151,225, Cl. 260-878.00R.

Burba, Christian; Volland, Hans-Guenter; and Esper, Norbert, to Schering Aktiengesellschaft. Polyvinyl chloride plastisols and method of coating metal therewith. 4,151,317, Cl. 427-388.00D.

Burg, Karlheinz: *See*—
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Leugering, Hans J.; and Heller, Alwin, 4,151,346, Cl. 528-230.000.

Burger, Norman D., to Mardesich, Nicholas A., a part interest. Method for undercap filling of a barrier pack aerosol container. 4,150,522, Cl. 53-470.000.

Burnett, James E., to Mead Corporation, The. Optical scanning and encoding device. 4,151,555, Cl. 358-75.000.

Burns, James F.: *See*—
Struger, Odo J.; Bremenour, Edwin L.; Burns, James F.; and Jerva, Ronald E., 4,151,580, Cl. 361-415.000.

Burns, Richard C.: *See*—
Packard, Thomas N.; and Burns, Richard C., 4,151,471, Cl. 325-473.000.

Burroughs Corporation: *See*—
Lazzarotti, Sebastian J.; Bradshaw, Robert S.; and Hunter, James R., 4,150,743, Cl. 198-460.000.
McMillan, Andrew H.; and Templeton, William B., 4,151,410, Cl. 250-223.00R.
Schreiber, James N.; and Bumgardner, Donald L., 4,151,564, Cl. 360-2.000.

Burst, Hermann: *See*—
Hensler, Paul; Eyb, Wolfgang; Hetmann, Richard; and Burst, Hermann, 4,151,508, Cl. 340-64.000.

Burton, Charles G., to Chisholm-Ryder Company, Inc. Collector leaf construction for harvesting machine. 4,150,526, Cl. 56-329.000.

Burton, Charles M.: *See*—
Brown, Russell L.; and Burton, Charles M., 4,151,408, Cl. 250-203.00R.

Buszek, Frank J. Gasoline engine fuel saver. 4,150,639, Cl. 123-25.00B.

Butler, James K. Retractable specimen holder for a rotary microtome. 4,150,593, Cl. 83-42.000.

Butler, L. Dennis, to Sperry Rand Corporation. Bale wagon. 4,150,756, Cl. 414-40.000.

Butler, Walter J.: *See*—
Barron, Mark B.; and Butler, Walter J., 4,151,539, Cl. 357-24.000.

B.V. en Scheepswerf en Machinefabrick "de liesbosch" B.V.: *See*—
Sijthoff, Jan Piet t., 4,150,502, Cl. 37-58.000.

C. G. Conn, Ltd.: *See*—
Southard, James S., 4,150,599, Cl. 84-1.030.

California Institute of Technology: *See*—
Perkins, Gerald S., 4,150,925, Cl. 417-418.000.

Caloni, Olivio; and Cantini, Alfredo. Process for obtaining surfaces with a nacre like effect on gold or silver jewelry articles. 4,151,054, Cl. 204-129.350.

Calvin, Donald W., to Dow Chemical Company, The. Removing oil from water. 4,151,078, Cl. 210-30.00A.

Camsco, Inc.: *See—*
Higgins, Bobby L., 4,150,794, Cl. 239-596.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Waggoner, Clinton A.; and Schmitz, Murdock E., 4,151,253, Cl. 422-68.000.

Canada Packers Limited: *See—*
Smith, Lynton R., 4,151,161, Cl. 260-118.000.

Canadair Limited: *See—*
Knap, Joseph, 4,150,509, Cl. 49-123.000.

Canron, Inc.: *See—*
Pearson, Eugene W.; and Short, Wilbur G., 4,150,594, Cl. 83-91.000.
Short, Wilbur G., 4,150,596, Cl. 83-380.000.

Cantini, Alfredo: *See—*
Caloni, Olivio; and Cantini, Alfredo, 4,151,054, Cl. 204-129.350.

Cantor, Abraham; and Winicov, Murray W., to West Laboratories, Inc. Stabilized iodine tincture. 4,151,275, Cl. 424-80.000.

Capelle, Gene A.; Sutton, David G.; and Benson, Sidney W., to Aerospace Corporation, The. Measurement of concentrations of gaseous phase elements. 4,150,951, Cl. 23-232.00E.

Capozzolo, John: *See—*
Robey, Raymond J.; and Capozzolo, John, 4,151,266, Cl. 423-425.000.

Cappa, Maurus, to International Business Machines Corporation. Voltage sequencing circuit for sequencing voltages to an electrical device. 4,151,425, Cl. 307-130.000.

Capuano, Italo A.; and Miller, Edward G. pH monitor with automatic buffer standardization. 4,151,255, Cl. 422-76.000.

Caputi, William J., Jr., to Cutler-Hammer, Inc. Multipath communications system. 4,151,524, Cl. 343-6.50R.

Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Method of writing addresses on a magnetic recording medium. 4,151,571, Cl. 360-77.000.

Carl Still Recklinghausen, Firma: *See—*
Stratmann, Josef; and Strobel, Manfred, 4,151,082, Cl. 210-83.000.

Carle & Montanari S.p.A.: *See—*
Palmieri, Angelo; and Salicini, Sandro, 4,150,520, Cl. 53-225.000.

Carlson, Elmer V.; and Killion, Mead C., to Industrial Research Products, Inc. FET Amplifier with protective circuit. 4,151,480, Cl. 330-277.000.

Carpenter, Walter L.: *See—*
Wolf, Ludwig, Jr.; and Carpenter, Walter L., 4,151,088, Cl. 210-180.000.

Carr, Francis L.: *See—*
Beck, William P.; and Carr, Francis L., 4,150,482, Cl. 30-43.900.

Carrieri, Louis F.: *See—*
Spanke, Edwin A.; and Carrieri, Louis F., 4,150,618, Cl. 100-257.000.

Carrock, Frederick E.: *See—*
Ackerman, Alfred J.; and Carrock, Frederick E., 4,151,128, Cl. 260-17.00A.

Cartec Costruzione Articoli Tecnici di Luciano Giulini: *See—*
Giulini, Luciano, 4,150,515, Cl. 52-12.000.

Casiraghi, Giovanni: *See—*
Casnati, Giuseppe; Casiraghi, Giovanni; Puglia, Giuseppe; Sartori, Giovanni; and Terenghi, Giuliana, 4,151,201, Cl. 260-562.00A.

Casnati, Giuseppe; Casiraghi, Giovanni; Puglia, Giuseppe; Sartori, Giovanni; and Terenghi, Giuliana, to Montedison S.p.A. Process for preparing 2-hydroxybenzoic aldehydes. 4,151,201, Cl. 260-562.00A.

Cassidy, Edward L., Sr., to Alamance Industries, Inc. Panty hose with elastic waist band. 4,150,554, Cl. 66-172.00E.

Castegnaro, Erminia: *See—*
di Salle, Enrico; Praga, Claudio; and Castegnaro, Erminia, 4,151,283, Cl. 424-261.000.

Cater, Betty J., administratrix: *See—*
Mattil, Karl F.; Rhee, Khee C.; and Cater, Carl M., deceased, 4,151,310, Cl. 426-656.000.

Cater, Carl M., deceased: *See—*
Mattil, Karl F.; Rhee, Khee C.; and Cater, Carl M., deceased, 4,151,310, Cl. 426-656.000.

Caterpillar Tractor Co.: *See—*
Dester, Delbert D.; and Wright, Paul L., 4,150,857, Cl. 305-12.000.
Fox, Lawrence E.; Groff, Eugene R.; and Wright, Paul L., 4,150,858, Cl. 305-57.000.
Hakkenberg, Peter; and Livesay, Richard E., 4,150,856, Cl. 305-11.000.
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; Miller, Robert G.; and Caterpillar Tractor Co., 4,150,654, Cl. 123-179.00L.
Karstensen, Karl W., 4,150,915, Cl. 415-139.000.
Sons, Charles C., Jr., 4,150,703, Cl. 152-361.00R.

Cates, John A. Game apparatus. 4,150,829, Cl. 273-265.000.

Caulin, Francine B.; and Bastian, James W., to Armour Pharmaceutical Company. Method of suppressing gastric acid secretion by the oral administration of calcitonin. 4,151,276, Cl. 424-111.000.

Cecil Equipment Co., The: *See—*
Cecil, Shelby, 4,151,394, Cl. 219-124.340.

Cecil, Shelby, to Cecil Equipment Co., The. Guidance system for arc welder. 4,151,394, Cl. 219-124.340.

CEFILAC: *See—*
Pontre, Gilbert, 4,151,461, Cl. 324-54.000.

Celanese Corporation: *See—*
Neuschwanter, Chris F.; and Levine, Eli, 4,151,147, Cl. 260-29.60T.
Patella, Ralph F., 4,151,146, Cl. 260-29.60T.
Paul, James L.; Pieper, Wendell L.; and Wade, Leslie E., 4,151,209, Cl. 260-604.0HF.
Rosenthal, Arnold J.; Forschirm, Alex S.; and Barnes, Bruce P., 4,151,322, Cl. 428-254.000.

Cenker, Moses: *See—*
Kan, Peter T.; and Cenker, Moses, 4,151,334, Cl. 521-105.000.

Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie: *See—*
Josis, Christian R., 4,150,957, Cl. 55-53.000.

Cermak, Michael J.; and Merchant, Stanley R., to Ford Motor Company. Temperature compensated resistive exhaust gas sensor construction. 4,151,503, Cl. 338-14.000.

Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, to Snamprogetti S.p.A. Alpha olefin polymerization catalyst comprising an alkyl halide and a combination product of $TiCl_3$ and transition metal chloride of vanadium, manganese, cobalt or iron. 4,151,110, Cl. 252-429.00C.

Cha, Chang Y.; and Bartel, William J., to Occidental Oil Shale, Inc. Determining the locus of a retorting zone in an oil shale retort by rate of shale oil production. 4,150,722, Cl. 166-251.000.

Chambers, William J.; and Foss, Robert P., to Du Pont de Nemours, E. I., and Company. Photosensitive article having polyaldehydes and its use in photoimaging. 4,150,989, Cl. 96-35.100.

Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Optically active amine salts. 4,151,360, Cl. 560-95.000.

Chance, Davey J.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,151,388, Cl. 219-69.00C.

Chang, Andrew K.: *See—*
Roberts, Thomas E., Jr.; Wiederrich, James L.; Lill, Melvin H.; and Chang, Andrew K., 4,150,897, Cl. 356-152.000.

Chaplick, Adolph M., to USM Corporation. Stiffening composition and method. 4,151,155, Cl. 260-40.00R.

Chas. S. Tanner Co.: *See—*
Eckert, Rene A., 4,151,316, Cl. 427-381.000.

Charschan, Sidney S.; and Tice, Edward S., to Western Electric Company, Inc. Laser annealing. 4,151,014, Cl. 148-13.000.

Chasin, David G.; and Feltzin, Joseph, to ICI Americas Inc. Cationic, cross-linkable acrylic-polyester resin binder systems. 4,151,148, Cl. 260-29.6RB.

Cheiky, Michael C.: *See—*
Richey, Joseph B.; Wake, Robert H.; Wilson, Henry H.; and Cheiky, Michael C., 4,151,416, Cl. 250-363.00S.

Chemie Linz Aktiengesellschaft: *See—*
Menzl, Kurt; and Franzmair, Rudolf, 4,151,164, Cl. 260-239.950.

Cheng, Dah-Chieh O., to Eastman Kodak Company. Process for the preparation of p-nitroaniline compounds by the alkaline hydrolysis of mixed anilides. 4,151,203, Cl. 260-582.000.

Chevron Research Company: *See—*
Bacskai, Robert, 4,151,109, Cl. 252-428.000.
Bacskai, Robert; and Parker, Phillip H., 4,151,221, Cl. 260-857.0PE.
Kurkov, Victor P., 4,151,171, Cl. 260-326.50E.
Singer, Malcolm S., 4,151,279, Cl. 424-248.500.

Chi, Chang Hwi. Laser cavity structure. 4,151,487, Cl. 331-94.50C.

Chiou, Win L.: *See—*
Riegelman, Sidney; and Chiou, Win L., 4,151,273, Cl. 424-78.000.

Chisholm, Edward E.: *See—*
Fernandez, Eugenio A.; and Chisholm, Edward E., 4,151,402, Cl. 235-92.0PK.

Chisholm-Ryder Company, Inc.: *See—*
Burton, Charles G., 4,150,526, Cl. 56-329.000.

Chiyoda Chemical Eng. & Constr. Co. Ltd.: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,150,716, Cl. 165-1.000.

Chloride Silent Power Limited: *See—*
May, Geoffrey J.; and Tan, Stephen R., 4,151,235, Cl. 264-13.000.

Chlorine Engineers Corp., Ltd.: *See—*
Goto, Nobutaka; and Daidoji, Hiroshi, 4,151,052, Cl. 204-95.000.

Choi, Charles K., to Occidental Research Corporation. Process for the pyrolysis of carbonaceous materials in a double helix cyclone. 4,151,044, Cl. 201-12.000.

Chong, Berni P.; and Rowe, Robert R., to Rohm and Haas Company. Inert interface beads of a crosslinked copolymer of methyl methacrylate and hydroxyalkyl methacrylate for regeneration of mixed bed ion exchange columns. 4,151,332, Cl. 521-28.000.

Christensen, Edward W., II: *See—*
Kratz, Jerrold K.; and Christensen, Edward W., II, 4,151,561, Cl. 358-248.000.

Christianson, Thomas K.: *See—*
Moore, Eugene R.; Christianson, Thomas K.; and Wence, Ronald L., 4,151,141, Cl. 260-29.60R.

Christie, Donald R., to Huyck Corporation. Papermakers belt. 4,151,323, Cl. 428-235.000.

Chrysler Corporation: *See—*
Hurst, John W., 4,150,590, Cl. 74-780.000.

Chugai Denki Kogyo Kabushiki-Kaisha: *See—*
Shibata, Akira, 4,150,982, Cl. 75-173.00A.

Ciba-Geigy AG: *See—*
Gosteli, Jacques, 4,151,170, Cl. 260-323.000.
Lang, Walter; Jeanneret, Remy; and Kaiser, Anton, 4,150,947, Cl. 8-93.000.
Maternaghan, Trevor J., 4,150,994, Cl. 96-94.00R.

Ciba-Geigy Corporation: *See—*
Drabek, Jozef; and Meyer, Alfred, 4,151,298, Cl. 424-304.000.
Evans, Samuel; and Rasberger, Michael, 4,151,356, Cl. 544-195.000.
Hubele, Adolf, 4,151,295, Cl. 424-285.000.
Hubele, Adolf, 4,151,299, Cl. 424-309.000.
Troxler, Eduard; and Luthi, Christian, 4,151,163, Cl. 260-239.700.
Weis, Claus D., 4,151,210, Cl. 260-607.0AR.
Wurmli, Albert, 4,150,944, Cl. 94.24-.
Zondler, Helmut, 4,151,229, Cl. 260-968.000.

Cienfuegos, Henry. Seat for bicycles and the like. 4,150,851, Cl. 297-195.000.

Cipris, Jan: *See—*
Pretsch, Edwin R.; and Cipris, Jan, 4,150,742, Cl. 198-459.000.

Circello, Joseph C.: *See—*
Howell, Thomas H.; Scriver, Robert E.; and Circello, Joseph C., 4,151,510, Cl. 340-146.1AL.

Cities Service Company: *See—*
Anderson, Howard A., 4,150,764, Cl. 220-263.000.

Citizen Watch Company Limited: *See—*
Mochizuki, Yoshifumi; and Yoshida, Makoto, 4,150,537, Cl. 58-23.00R.
Morokawa, Shigeru; Sekiya, Fukuo; and Hashimoto, Yukio, 4,150,535, Cl. 58-23.00R.
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, 4,150,536, Cl. 58-23.00D.
Nakayama, Yasuaki; and Tanaka, Ryuzo, 4,150,538, Cl. 58-88.00R.

Citrone, Anthony M.; and Avery, Richard W., to Reckitt & Colman Products Ltd. Coating compositions. 4,151,138, Cl. 260-28.5AV.

Ciuryla, Vincent T.; and Greskovich, Eugene J., to Air Products and Chemicals, Inc. Removal of sulfur oxides from gases by scrubbing with ammoniacal solutions. 4,151,263, Cl. 423-242.000.

Clark Equipment Company: *See—*
Asche, James E., 4,150,504, Cl. 37-103.000.
Bauer, James J.; and Sagaser, Thomas M., 4,150,474, Cl. 29-463.000.
Patton, Jon R., 4,150,737, Cl. 192-13.00R.

Clark, V. Doyne, to Herring, Carrol, a part interest. Fish holder with rotatable clamping jaws. 4,150,460, Cl. 17-70.000.

Clausen, Victor H.; and Asbury, Charles E., Jr., to H. B. Fuller Company. String type adhesive dispensing system. 4,150,800, Cl. 242-131.000.

Clorox Company, The: *See—*
Alvarez, Vincent E.; and Maddox, Lodric L., 4,151,104, Cl. 252-99.000.

Close, Thomas H., to Eastman Kodak Company. Exposure control apparatus including rate responsive lag compensation. 4,150,891, Cl. 354-32.000.

Cloyd, Harold S., to Nosco Plastics, Inc. Plastic trays for drying fruit. 4,150,496, Cl. 34-238.000.

CMB Colonia Management- und Beratungsgesellschaft mbH & Co. KG.: *See—*
Fricke, Jobst; Voigt, Wolfgang; and Schmitz, Jurgen, 4,151,368, Cl. 179-1.00M.

Coffta, Joseph A.; Heim, William P.; Wilsdon, Thomas A.; and Barlis, Glenn A., to Westinghouse Electric Corp. Multi-phase switch with variable pole spacing. 4,151,384, Cl. 200-153.00R.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of optically active vitamin E. 4,151,177, Cl. 260-340.90R.

Cohen, Noal; and Saucy, Gabriel, to Hoffman-La Roche Inc. Synthesis of vitamin E. 4,151,205, Cl. 260-590.00R.

Coleman, John R.; and Washburn, Clyde, to Harris Corporation. Phase detector circuit. 4,151,473, Cl. 328-134.000.

Collett, Wells I., to General Electric Company. Method and apparatus for load following with a single-cycle boiling moderator-coolant nuclear reactor. 4,150,546, Cl. 60-644.000.

Collins, Herbert, to Schenley Industries, Inc. Bottle closure-cup assembly. 4,150,761, Cl. 215-228.000.

Collins, Paul W.; and Pappo, Raphael, to G. D. Searle & Co. Intermediates for prostaglandin synthesis. 4,151,187, Cl. 260-429.700.

Colt Industries Operating Corp.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,151,388, Cl. 219-69.00C.
Berent, John G., 4,150,645, Cl. 123-119.0EC.

Colton, John W., to UOP Inc. Pretreatment of raw natural gas prior to liquefaction. 4,150,962, Cl. 62-17.000.

Columbus McKinnon Corporation: *See—*
Behnke, Edward R., 4,150,488, Cl. 33-168.00R.

Combustion Engineering, Inc.: *See—*
Frey, Donald J.; and Hamilton, Thomas B., 4,150,631, Cl. 110-186.000.
Matthews, Francis T., 4,150,632, Cl. 110-342.000.

Comcorps Communication Corps Inc.: *See—*
Whatley, Thomas J.; and Drennen, William M., Jr., 4,150,883, Cl. 352-87.000.

Commissariat a l'Energie Atomique: *See—*
Marchand, Joseph; and Roger, Andre, 4,151,252, Cl. 422-51.000.

Communications Satellite Corporation: *See—*
Berman, Arnold; Mahle, Christoph E.; and Assal, Francois T., 4,151,489, Cl. 333-103.000.
Dinstein, Its'hak, 4,151,550, Cl. 358-13.000.

Comolli, Alfred G., to Hydrocarbon Research, Inc. Process for phase separation. 4,151,073, Cl. 208-340.000.

Compagnie d'Informatique Militaire, Spatiale et Aeronautique: *See—*
Valin, Jacques, 4,151,536, Cl. 346-162.000.

Compagnie Generale des Etablissements Michelin: *See—*
Reiniche, Andre; and Sauvage, Philippe, 4,150,706, Cl. 164-49.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,151,571, Cl. 360-77.000.

Compagnie Neerlandaise de l'Azote (Societe Anonyme): *See—*
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and van der Sijpt, Gerardus F., 4,150,965, Cl. 71-27.000.

Comparetto, John E. Osteotome and a method of surgically using same. 4,150,675, Cl. 128-305.000.

Compen, Johannes M. A. A., to U.S. Philips Corporation. Making a cathode ray tube having a conductive coating on the inner surface with a sharply defined smooth edge. 4,151,312, Cl. 427-64.000.

Compere, Louis. Body scrubber. 4,150,458, Cl. 15-222.000.

Concast Incorporated: *See—*
John, Wolfgang W., 4,150,710, Cl. 164-82.000.

Condit, Paul A. Valves. 4,150,811, Cl. 251-315.000.

Consonni, Pietro: *See—*
Sale, Amedeo O.; Pifferi, Giorgio; Consonni, Pietro; Diena, Alberto; and DelTurco, Bonaccorso R., 4,151,169, Cl. 260-308.00R.

Constructions Metalliques de Provence: *See—*
Laignel, Raymond A.; and Mommeja, Patrick F., 4,150,810, Cl. 251-309.000.

Continental Group, Inc., The: *See—*
Cornell, Stephen W., 4,151,136, Cl. 260-23.00H.
Gordon, Gerald A., 4,150,747, Cl. 206-603.000.
Mazurek, Stanley L., 4,150,765, Cl. 220-269.000.

Cooper, Edward, to Power-Science, Inc. Integrating voltage to frequency converter and memory decoder. 4,151,464, Cl. 324-103.00P.

Cooper, Robert N., to Lake Chemical Company. Flux for use in soldering. 4,151,015, Cl. 148-23.000.

Cornell, Stephen W., to Continental Group, Inc., The. Acid reactable inorganic mineral fillers having improved compatibility with polyolefin resins. 4,151,136, Cl. 260-23.00H.

Corning Glass Works: *See—*
Takeguchi, Milton M.; and Weetall, Howard H., 4,150,950, Cl. 23-230.00B.

Cosquer, Philippe: *See—*
Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, 4,151,195, Cl. 260-465.00D.

Cotroneo, Francesco: *See—*
Bambara, Mario; and Cotroneo, Francesco, 4,151,375, Cl. 179-18.0ES.

Coulter Stork U.S.A., Inc.: *See—*
Kuehnle, Manfred R., 4,151,059, Cl. 204-192.00R.
Kuehnle, Manfred R., 4,151,064, Cl. 204-298.000.

Cousins, Raymond C.: *See—*
Seib, Paul A.; Cousins, Raymond C.; and Hoseney, Russell C., 4,151,178, Cl. 260-343.700.

Cowan, William G., to J. H. Carruthers & Company Limited. Overhead cranes. 4,150,625, Cl. 104-119.000.

Cozzi, Ennio; and Tardani, Massimo, to Snia Viscosa S.p.A. Societa Nazionale Industria Applicazioni Viscosa. Unsaturated polyester resin capable of entrapping an inert gas to form a structural foam. 4,151,335, Cl. 521-138.000.

Crawford, John G., to General Electric Company. Removable fluid take-off and pressure release coupling for washing machine and the like. 4,150,688, Cl. 137-562.000.

CRC-Crose, International, Inc.: *See—*
Kushner, Cherie E.; Tews, Paul A.; and Nelson, Jerome W., 4,151,395, Cl. 219-125.120.

Creehan, John T.: *See—*
Lafleur, Alonzo D.; Creehan, John T.; and Baugh, Robert E., 4,150,952, Cl. 23-301.000.

Crescioni, Claude: *See—*
Debat, Jacques; Lemoine, Jean; Guay, Bernard; and Crescioni, Claude, 4,151,278, Cl. 424-195.000.

Criger, Glenn L.: *See—*
Roden, William A.; and Criger, Glenn L., 4,150,775, Cl. 228-50.000.

Crivello, James V., to General Electric Company. Method of photopolymerizing polymerizable compositions containing group Va onium salts. 4,150,988, Cl. 96-35.100.

Crivello, James V.; and Lam, Julia H. W., to General Electric Company. Method for making diarylhalonium salts. 4,151,175, Cl. 260-326.260.

Crnojevich, Ranko; Wiewiorowski, Edward I.; and Wilkinson, Donald H., to Amax Inc. Dissolution of cobaltic hydroxide with organic reductant. 4,151,258, Cl. 423-150.000.

Crochemore, Michel, to Philagro. Process for the preparation of aliphatic isocyanates. 4,151,193, Cl. 260-453.00P.

Crocker, James E. Toilet seat lifter. 4,150,446, Cl. 4-251.000.

Crosby, John: *See—*
Ashcroft, Peter L.; and Crosby, John, 4,151,153, Cl. 260-37.00N.

Crumrine, John C., to Richardson Manufacturing Company, Inc. Implement with compensation for terrain irregularities. 4,150,725, Cl. 172-678.000.

Cuenoud, Gerard; Farkas, Rudolf; Revillet, Georges; and Sanz, Manuel, to Battelle Memorial Institute. Electromagnet motor control for constant volume pumping. 4,150,922, Cl. 417-45.000.

Cummins Engine Company, Inc.: *See—*
Egan, John J., 4,150,640, Cl. 123-97.00B.
Wade, James A.; and Smith, Edward D., 4,150,651, Cl. 123-140.0FG.

Curiger, Karl: *See—*
Gasser, Hermann; and Curiger, Karl, 4,150,533, Cl. 57-265.000.

Curran, Roger, to Bangor Punta Operations, Inc. Gas fired gun with gas cartridge puncture device. 4,150,656, Cl. 124-74.000.

Cushing, Donald S.; and Jenkins, Thomas E., to General Electric Company. Dishwasher with improved bypass filter arrangement. 4,150,679, Cl. 134-104.000.

Cutler-Hammer, Inc.: *See*—
Caputi, William J., Jr., 4,151,524, Cl. 343-6.50R.

Cyr, Steven J.; and Schubert, John C., to Standard Oil Company (Indiana). Container. 4,150,777, Cl. 229-2.50R.

Daido Metal Company Ltd.: *See*—
Mori, Sanae, 4,150,983, Cl. 75-175.00A.

Daidoji, Hiroshi: *See*—
Goto, Nobutaka; and Daidoji, Hiroshi, 4,151,052, Cl. 204-95.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; and Gabler, Rolf, 4,150,954, Cl. 48-102.00A.
Helmer, Josef; and Gaus, Hermann, 4,150,543, Cl. 60-403.000.

Dain, Richard J., to Dart Industries Inc. Method for the recovery of metallic copper. 4,150,976, Cl. 75-117.000.

Dali, George J., to Eastman Kodak Company. Bi-directional optical scanning. 4,150,873, Cl. 358-285.000.

Daniel, David W.: *See*—
Hibarger, George E.; Hibarger, George G.; and Daniel, David W., 4,150,909, Cl. 405-27.000.

Dannenburg, Warren N.: *See*—
Welstead, William J., Jr.; and Dannenburg, Warren N., 4,151,282, Cl. 424-258.000.

Dant & Russell, Inc.: *See*—
Potter, Edward, 4,150,790, Cl. 238-83.000.

Daravingas, George V.: *See*—
Yueh, Mao H.; Daravingas, George V.; Rigelhof, Fred J.; and Mueller, Herman W., 4,151,307, Cl. 426-549.000.

Dart Industries Inc.: *See*—
Dain, Richard J., 4,150,976, Cl. 75-117.000.

d'Auria, Luigi, to Thomson-CSF. Adjustable distributor device for shared transmission of radiant energy. 4,150,870, Cl. 350-96.160.

Davenport, John M.; and Diamond, Michael N., to General Electric Company. Instant light lamp control circuit. 4,151,445, Cl. 315-92.000.

David, Paul M.; and Rey, Bernard H. E., to Redalum, Societe Anonyme. Apparatus for the application of a fabric covering the frame of a lampshade. 4,151,036, Cl. 156-475.000.

Davis, Henry J. Blower for industrial vacuum machine. 4,150,913, Cl. 415-119.000.

Davis, Kenneth G.; Due, George B.; and Lund, Albert H., to Mobil Oil Corporation. Storage stable water-dilutable epoxy based coating for metal food contact surfaces. 4,151,305, Cl. 426-131.000.

Dawson, William; Foulis, Michael J.; Gutteridge, Norman J. A.; and Smith, Colin W., to Lilly Industries Limited. Cyclopentone propanoic acid compounds. 4,151,199, Cl. 562-504.000.

Dayco Corporation: *See*—
Hollaway, Gerald C., Jr., 4,151,129, Cl. 260-17.4BB.
Regan, Joseph P.; and Thomas, James R., 4,150,928, Cl. 425-40.000.

Debat, Jacques; Lemoine, Jean; Guay, Bernard; and Crescioni, Claude, to Institut de Recherches Chimiques et Biologiques Appliquees. Process for the preparation of an extract of *Teucrium marum* used in particular in therapy. 4,151,278, Cl. 424-195.000.

Debenham, Michael, to Broken Hill Proprietary Company, Limited, The. Method of lining container closures. 4,151,314, Cl. 427-239.000.

De Busscher, Cyriel R. J.; Dekeyzer, Marcel A.; and van Herpe, Francois, to Sperry Rand Corporation. Combine harvester. 4,150,525, Cl. 56-14.600.

De Cenzo, Herbert A. Flexible tube coupling with symmetrical anchor ring. 4,150,847, Cl. 285-93.000.

Deere & Company: *See*—
Meiers, Gerald F., 4,150,527, Cl. 56-341.000.
Poore, Bernard B., 4,150,565, Cl. 73-133.00R.
Sawyer, Bobby G., 4,150,524, Cl. 56-1.000.

De Graaff, Hendrik C.; Hart, Paul A. H.; Schmitz, Albert; and Slotboom, Jan W., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,151,006, Cl. 148-1.500.

Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, to BASF Aktiengesellschaft. Uniformly dyed water-swellable cellulosic fibers. 4,150,943, Cl. 8-41.00R.

de Jonge, Frederik A., to U.S. Philips Corporation. Magneto-resistive detector with scanning bubble domain. 4,151,600, Cl. 365-8.000.

Dekeyzer, Marcel A.: *See*—
De Busscher, Cyriel R. J.; Dekeyzer, Marcel A.; and van Herpe, Francois, 4,150,525, Cl. 56-14.600.

Delagi, Richard G.: *See*—
McBride, Lyle E.; Delagi, Richard G.; and Trenkler, George, 4,151,407, Cl. 250-199.000.

Delery, Marc G., to Trappeur. Molded boot. 4,150,500, Cl. 36-117.000.

DelTurco, Bonaccorso R.: *See*—
Sale, Amedeo O.; Pifferi, Giorgio; Consonni, Pietro; Diena, Alberto; and DelTurco, Bonaccorso R., 4,151,169, Cl. 260-308.00R.

De Luca, Carlo B., to Teledyne Industries, Inc. Method of manufacturing electrical connector. 4,151,392, Cl. 219-118.000.

Demido, Michael, to General Motors Corporation. Vehicle load responsive brake actuating pressure proportioner and actuating linkage therefor. 4,150,855, Cl. 303-22.00R.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwamoto, Sadayuki, 4,150,999, Cl. 106-73.500.

Dentsply Research & Development Corp.: *See*—
Breining, Grant; and Webb, Ronald C., 4,150,752, Cl. 211-13.000.

Derain, Claude, to Eviers Denis. Process for manufacturing stainless steel sinks whose tubs or drain boards are colored. 4,150,472, Cl. 29-458.000.

Derderian, George; and Mohon, Windell N., to United States of America, Navy, Laser safety goggles. 4,151,411, Cl. 250-225.000.

Derichs, Josef, to W. Schlafhorst & Co. Method and device for controlling the thread joining in rotor spinning machines. 4,150,530, Cl. 57-263.000.

Derr, Paul B.: *See*—
Snyder, Clair W., Jr.; Derr, Paul B.; and Wycheck, Thomas H., 4,150,866, Cl. 339-94.00M.

DeSoto, Inc.: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,151,131, Cl. 260-19.0EP.

Dester, Delbert D.; and Wright, Paul L., to Caterpillar Tractor Co. Armored cushioning lug for track-type vehicles. 4,150,857, Cl. 305-12.000.

Detroit Gasket and Manufacturing Company: *See*—
Doerfling, Ralph G., 4,150,850, Cl. 296-137.00A.

Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Computer organ with extended harmonics. 4,150,600, Cl. 84-1.110.

Dexion-Comino International Limited: *See*—
Harrison, Frank B.; and Hornsby, Colin J., 4,150,510, Cl. 49-388.000.

Diamond, Michael N.: *See*—
Davenport, John M.; and Diamond, Michael N., 4,151,445, Cl. 315-92.000.

Dickson, Andrew C.: *See*—
Barry, James W.; and Dickson, Andrew C., 4,151,250, Cl. 264-532.000.

Didier Engineering GmbH: *See*—
Wagener, Dietrich, 4,151,045, Cl. 202-128.000.

Diena, Alberto: *See*—
Sale, Amedeo O.; Pifferi, Giorgio; Consonni, Pietro; Diena, Alberto; and DelTurco, Bonaccorso R., 4,151,169, Cl. 260-308.00R.

Dietrich, Hans, to Losinger AG. Method to produce an anchor on a tendon twisted of several steel wires. 4,150,473, Cl. 29-461.000.

Digital Equipment Corporation: *See*—
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,151,593, Cl. 364-200.000.

Dihse, Bernfried: *See*—
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Dill, Walter R.; and Knox, John A., to Halliburton Company. Acidizing subterranean well formations containing deposits of metal compounds. 4,151,098, Cl. 252-8.55C.

Dillow, Brian St. P., to Misomex Aktiebolag. Methods for providing transparent originals for printing plate production or for direct production of printing plate. 4,150,991, Cl. 96-41.000.

DiMarco, Bernard: *See*—
Rys, Tadeusz J.; and DiMarco, Bernard, 4,151,495, Cl. 335-26.000.

Dingler, Geoffrey L.: *See*—
Johnson, Philip P.; and Dingler, Geoffrey L., 4,150,680, Cl. 134-104.000.

Dinstein, Its'hak, to Communications Satellite Corporation. DPCM Predictors for NTSC color composite TV signals using phase adjustment of sampling. 4,151,550, Cl. 358-13.000.

di Salle, Enrico; Praga, Claudio; and Castegnaro, Erminia, to Societa' Farmaceutici Italia S.p.A. 6-Methyl-and 1,6-dimethyl-8β-carbobenzyloxy-aminomethyl-10α-ergoline as inhibitors of prolactin secretion. 4,151,283, Cl. 424-261.000.

Dischler, Helmut; Huydts, Eduard; and Lohmann, Gert, to G. Siempelkamp GmbH & Co., Firma. Adjustable friction clutch for presses. 4,150,739, Cl. 192-107.00R.

Disteldorf, Josef: *See*—
Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, 4,151,338, Cl. 526-185.000.
Schmitt, Karl; Disteldorf, Josef; and Schmitt, Flexi, 4,151,152, Cl. 260-33.6UB.

Ditmore, Harry B., Jr. Data processing system. 4,150,782, Cl. 235-455.000.

Dixon, Dale D.: *See*—
Herman, Frederick L.; and Dixon, Dale D., 4,151,142, Cl. 260-29.60R.

DND Teletronics, Inc.: *See*—
Fitts, Fred E., III; and Batteas, J. D., 4,151,372, Cl. 179-7.10R.

Dr. Ing. Rudolf Hell GmbH: *See*—
Gast, Uwe; and Taudt, Heinz, 4,151,563, Cl. 358-298.000.

Dr. Johannes Heidenhain GmbH: *See*—
Hiesinger, Leopold, 4,151,321, Cl. 428-195.000.

Dr. Th. Wieland, Firma: *See*—
Obermeier, Friedrich, 4,150,941, Cl. 431-355.000.

Doerfling, Ralph G., to Detroit Gasket and Manufacturing Company. Foam laminates and headliners. 4,150,850, Cl. 296-137.00A.

Dolgonas, Gene: *See*—
Krayenbuhl, Harold A.; Dolgonas, Gene; and Rogers, Charles J., 4,150,540, Cl. 60-271.000.

Donaghue, Paul F.; and Mitchell, Kenneth A. W., to ICI Australia Limited. Immobilized explosive component in foamed matrix. 4,151,022, Cl. 149-19.400.

Donaldson Company, Inc.: *See*—
Wright, Mervin E., 4,151,095, Cl. 210-443.000.

Dorey, Jacques A., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Radio beacon for aerial navigation system. 4,151,529, Cl. 343-106.00D.

d'Orgelys, Henri Y. Childproof enclosure. 4,150,760, Cl. 215-213.000.

Dorsemagen, Stephan; and Eiting, Hermann, to Siemens Aktiengesellschaft. Circuit arrangement for the slow, constant forward or reverse movement of the write/read heads in a cylinder memory. 4,151,568, Cl. 360-75.000.

Dorsemagen, Stephen; and Eiting, Hermann, to Siemens Aktiengesellschaft. Circuit arrangement for offsetting the data heads of a data cylinder memory by a determinate amount from the mid-position of the data cylinder. 4,151,567, Cl. 360-75.000.
Doss, Richard C.; and Reusser, Robert E., to Phillips Petroleum Company. Release substrate. 4,151,344, Cl. 528-34.000.
Douglass, Thomas E., to Ferro Corporation. Process for molding bonded refractory particles. 4,150,514, Cl. 51-298.000.
Douno, Syugo, to Glory Kogyo Kabushiki Kaisha. Money exchanging system. 4,150,740, Cl. 194-4.00C.
Dove, Norman F. Apparatus and method for separating heavy impurities from feed stock. 4,151,083, Cl. 210-84.000.
Dow Chemical Company, The: *See—*
Brewbaker, James L.; and Sprenger, William A., 4,151,219, Cl. 260-836.000.
Calvin, Donald W., 4,151,078, Cl. 210-30.00A.
Emig, Gale L.; and Moldovan, Daniel, 4,151,145, Cl. 260-29.60S.
Lalk, Robert H.; and Evani, Syamalarao, 4,151,341, Cl. 260-29.6RW.
Moore, Eugene R.; Christianson, Thomas K.; and Wence, Ronald L., 4,151,141, Cl. 260-29.60R.
Murchison, Craig B.; and Murdick, Dewey A., 4,151,190, Cl. 260-449.00R.
Peters, James; and Meyer, Victor E., 4,151,150, Cl. 260-29.70R.
Trepanier, Donald L.; and Britton, Thomas C., 4,151,166, Cl. 260-306.70T.
Volk, Henry; and Lamphere, Jack C., 4,151,140, Cl. 260-29.60H.
Dowell, Arthur M.; and Judd, Henry E., to Teepak, Inc. Treatment of regenerated cellulose casings with surface activating energy. 4,150,697, Cl. 138-118.100.
Drabek, Jozef; and Meyer, Alfred, to Ciba-Geigy Corporation. Anthelmintic compositions. 4,151,298, Cl. 424-304.000.
Drennen, William M., Jr.: *See—*
Whatley, Thomas J.; and Drennen, William M., Jr., 4,150,883, Cl. 352-87.000.
Dresser Industries, Inc.: *See—*
Baron, George B., 4,150,812, Cl. 254-190.00R.
Hart, Ronald L., 4,151,362, Cl. 13-35.000.
Droste, Werner; and Adler, Walter, to Licentia Patent-Verwaltungs-G.m.b.H. Control device for the laying of pipe in deep water. 4,150,911, Cl. 405-177.000.
Droux, Jacques P.: *See—*
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,151,571, Cl. 360-77.000.
Druker, Leonard J.; and Kincaid, Robert B., to Minnesota Mining and Manufacturing Company. Lithographic fountain concentrate. 4,150,996, Cl. 106-2.000.
Ducasse, Joseph C. V. Filing system for vertically supporting documents. 4,150,860, Cl. 312-184.000.
Dudkowski, Joseph J., to American Cyanamid Company. 2,6-Dinitroaniline herbicidal compositions. 4,150,969, Cl. 71-121.000.
Due, George B.: *See—*
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,151,305, Cl. 426-131.000.
Dufrancatel, Michel. Article of furniture for campers. 4,150,861, Cl. 312-266.000.
Dunlop Limited: *See—*
Jones-Hinton, James, 4,151,029, Cl. 156-145.000.
Dunnrowicz, Clarence J.: *See—*
Sandy, Frank; and Dunnrowicz, Clarence J., 4,151,492, Cl. 333-191.000.
Du Pont de Nemours, E. I., and Company: *See—*
Adelman, Robert L.; and Howard, Edward G., Jr., 4,151,126, Cl. 252-508.000.
Bellina, Russell F., 4,151,296, Cl. 424-298.000.
Chambers, William J.; and Foss, Robert P., 4,150,989, Cl. 96-35.100.
McCann, Elrey L., III, 4,151,123, Cl. 252-462.000.
Simms, John A., 4,151,227, Cl. 260-885.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active thiourea and urea compounds. 4,151,288, Cl. 424-270.000.
Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Nitromethylene amidino derivatives containing imidazole groups. 4,151,289, Cl. 424-273.00R.
Dussart, Bernard, to Union Siderurgique du Nord et de l'Est de la France. Continuous-casting mould provided with an electromagnetic stirring device. 4,150,712, Cl. 164-147.000.
Duvdevani, Ilan; and Bock, Jan, to Exxon Research & Engineering Co. Blend compositions. 4,151,137, Cl. 260-23.50A.
Dynamit Nobel Aktiengesellschaft: *See—*
Buning, Robert, 4,151,225, Cl. 260-878.00R.
Dyroff, David R.; Suchanek, Walton F., Jr.; and Schiff, Thomas G., to Monsanto Company. Oral compositions. 4,151,271, Cl. 424-48.000.
Dyrup, Sven-Erik, to Trelleborg Aktiebolag. Coupling for non-metallic hose. 4,150,848, Cl. 285-238.000.
Dyson, Allen F.; and Marshall, David, to Allied Colloids Limited. Gloss emulsion paint containing a binder latex and two copolymers which are salts or copolymers of unsaturated monocarboxylic acid and an unsaturated ester. 4,151,144, Cl. 260-29.6WB.
Dziuk, Vincent B. Vehicle retainer for thermos bottles. 4,150,806, Cl. 248-154.000.
E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John, 4,151,354, Cl. 544-159.000.
Ondetti, Miguel A.; and Petrillo, Edward W., 4,151,172, Cl. 260-326.200.
E-Systems, Inc.: *See—*
Boor, Robert L., Jr.; Keller, Robert A.; and Kesinger, Donald E., 4,151,397, Cl. 219-216.000.
Eastman Kodak Company: *See—*
Cheng, Dah-Chieh O., 4,151,203, Cl. 260-582.000.
Close, Thomas H., 4,150,891, Cl. 354-32.000.
Dali, George J., 4,150,873, Cl. 358-285.000.
Howe, Dennis G.; Blazey, Richard N.; and Owens, James C., 4,150,880, Cl. 350-358.000.
Eastman, Mark E.: *See—*
Wennberg, Peder K.; and Eastman, Mark E., 4,150,921, Cl. 416-207.000.
Eaton, David C., to Imperial Chemical Industries Limited. Alkanolamine salts of phenolic resins. 4,151,028, Cl. 156-110.0MD.
Eaton, Michael A.: *See—*
Stebbing, Nowell; and Eaton, Michael A., 4,151,350, Cl. 536-29.000.
Eberly, Paul E., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,151,115, Cl. 252-434.000.
Eckert, Rene A., to Chas. S. Tanner Co. Flameproofing of polyester fabrics using brominated cycloalkanes. 4,151,316, Cl. 427-381.000.
Edmisson, Russell C.: *See—*
Bailey, Charles E.; Bass, Sidney; and Edmisson, Russell C., 4,150,903, Cl. 400-95.000.
Edwards, Bryan W.: *See—*
Washbourne, Colin; and Edwards, Bryan W., 4,150,849, Cl. 294-19.00R.
Egami, Kenji: *See—*
Suga, Tsuneo; Ogi, Keiji; and Egami, Kenji, 4,150,993, Cl. 96-64.000.
Egan, John J., to Cummins Engine Company, Inc. Fluidic exhaust valve opening system for an engine compression brake. 4,150,640, Cl. 123-97.00B.
Eguchi, Seiji: *See—*
Suzuki, Seigo; and Eguchi, Seiji, 4,151,592, Cl. 364-200.000.
Eichhorn, Friedrich: *See—*
Hirsch, Peter; Wubbels, Bernhard; and Schafer, Rolf, 4,151,389, Cl. 219-73.100.
Eidelberg, Joseph. Double effect floating solar still comprising a submerged condensing system. 4,151,046 Cl. 202-180.000.
Eiermann, Dankwart, to Borsig GmbH; and Wankel GmbH. Rotary piston compressor with transfer flow pockets in housing. 4,150,926, Cl. 418-61.00A.
Eilhardt, Bernd: *See—*
Ziemek, Gerhard; and Eilhardt, Bernd, 4,151,238, Cl. 264-45.500.
Eisler, Paul. Cooling apparatus. 4,150,551, Cl. 62-281.000.
Eiting, Hermann: *See—*
Dorsemagen, Stephan; and Eiting, Hermann, 4,151,568, Cl. 360-75.000.
Dorsemagen, Stephen; and Eiting, Hermann, 4,151,567, Cl. 360-75.000.
Electric Power Research Institute: *See—*
Brandt, Thomas F.; and Netzel, Philip C., 4,150,480, Cl. 29-628.000.
Electric Power Research Institute, Inc.: *See—*
Brobeck, William M., 4,150,582, Cl. 74-572.000.
Flick, Carl, 4,151,433, Cl. 310-54.000.
Electro Controls Inc.: *See—*
Labrum, Joseph H., 4,151,584, Cl. 362-302.000.
Electro-Voice, Incorporated: *See—*
Watson, Alan R., 4,151,378, Cl. 179-111.00R.
Electronic Stamping Corporation: *See—*
Walter, Leo, 4,150,864, Cl. 339-19.000.
Electronique Marcel Dassault: *See—*
Masliah, Leon; and Morand, Jean F., 4,151,527, Cl. 343-7.500.
Ellis, J. Scott. Electrical connectors and methods of connecting electrical conductors. 4,151,364, Cl. 174-84.00C.
El Sayed, Aziz: *See—*
Lindner, Christian; Korte, Siegfried; El Sayed, Aziz; and Suling, Carlhans, 4,151,228, Cl. 260-898.000.
El Sherif, Fouad; and Svoboda, Harry J., to Textron Inc. Electrohydraulic control module. 4,150,686, Cl. 137-377.000.
Eltsov, Konstantin S.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.
Emerick, Harold C. Method and apparatus for making dental castings. 4,150,707, Cl. 164-52.000.
Emig, Gale L.; and Moldovan, Daniel, to Dow Chemical Company, The. Latex-modified, pretensioned and prestressed structures having enhanced structural load bearing capacity. 4,151,145, Cl. 260-29.60S.
Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,151,288, Cl. 424-270.000.
Emmons, Robert E.: *See—*
Hayes, Thomas E.; Emmons, Robert E.; and Bechtel, Jon H., 4,150,571, Cl. 73-336.500.
Energy and Minerals Research Co.: *See—*
Tarpley, William B., Jr., 4,150,576, Cl. 73-594.000.
Engdahl, Arnold B., Jr., to Federal Paper Board Company Inc. Carton with pour spout. 4,150,778, Cl. 229-17.00R.
Engelbach, Heinz; Wistuba, Hermann; Sprague, Michael J.; Sturm, Hans-Juergen; and Armbrust, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of anthraquinone. 4,151,182, Cl. 260-369.000.

Enlow, William P.: *See—*
Hechenbleikner, Ingenuin; and Enlow, William P., 4,151,211, Cl. 260-609.00F.

Enokido, Nobuo: *See—*
Kanoh, Natsuki; Tanaka, Toru; and Enokido, Nobuo, 4,151,337, Cl. 526-116.000.

Entwistle, Robert J.: *See—*
Breglia, Denis R.; Entwistle, Robert J.; Oharek, Frank J.; and Rosendahl, Gottfried R., 4,150,885, Cl. 352-130.000.

Enviro Development Co., Inc.: *See—*
Zuckerman, Matthew M.; and Hamer, Leslie C., 4,151,080, Cl. 210-59.000.

Environment/One Corporation: *See—*
Peters, Philip H., Jr., 4,151,387, Cl. 219-10.49R.

Envirotech Corporation: *See—*
Pooser, A. Keith, Jr., 4,150,960. Cl. 55-440.000.

Enz, Ulrich E.: *See—*
Haisma, Jan; Van Mierloo, Klaas L. L.; Enz, Ulrich E.; and Bongers, Piet F., 4,151,602, Cl. 365-32.000.

Epie, Jean-Claude: *See—*
Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, 4,150,874, Cl. 350-292.000.

ESBE Plastics Dinkelsbuhl Brummer K.G.: *See—*
Brummer, Friedrich, 4,151,032, Cl. 156-215.000.

Espenscheid, Wilton F.: *See—*
Yan, Tsoung-Yuan; and Espenscheid, Wilton F., 4,151,066, Cl. 208-8.0LE.

Esper, Norbert: *See—*
Burba, Christian; Volland, Hans-Guenter; and Esper, Norbert, 4,151,317, Cl. 427-388.00D.

Etat Francais represente par le Delegue General Pour l'Armement: *See—*
Tocquet, Bernard, 4,151,437, Cl. 310-337.000.

Etherington, Murray D.; and Roberts, David V., to Joy Manufacturing Company. Fluid operable hammer. 4,150,603, Cl. 91-50.000.

Ethington, Donald, to Goodpasture, Inc. Method and apparatus for removing nitrogen oxides from a gas stream. 4,151,265, Cl. 423-396.000.

Ethyl Corporation: *See—*
Hafele, Robert X., 4,151,247, Cl. 264-328.000.

Evani, Syamalarao: *See—*
Lalk, Robert H.; and Evani, Syamalarao, 4,151,341, Cl. 260-29.6RW.

Evans, Anthony, to Lever Brothers Company. Method and composition for moisturizing the skin. 4,151,304, Cl. 424-361.000.

Evans, Robert F. Electrodeposition mining of materials from natural water bodies. 4,151,051, Cl. 204-86.000.

Evans, Samuel; and Rasberger, Michael, to Ciba-Geigy Corporation. 5-Triazin-2-yl phosphonates. 4,151,356, Cl. 544-195.000.

Evelyn, George B.; and James, Varnell L., to Boeing Company, The. Aircraft engine instaliation. 4,150,802, Cl. 244-54.000.

Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. α-Oxy(oxo) sulfides and uses thereof in perfumery and in perfumed articles. 4,151,103, Cl. 252-89.00R.

Eviers Denis: *See—*
Derain, Claude, 4,150,472, Cl. 29-458.000.

Evju, Hans, to Borregaard Industries Limited. Process for preparation of 3-methoxy-4-hydroxybenzaldehyde. 4,151,207, Cl. 260-600.00A.

Ewald, Douglas: *See—*
Grimm, Thomas; and Ewald, Douglas, 4,151,092, Cl. 210-256.000.

Extranuclear Laboratories, Inc.: *See—*
Fite, Wade L.; and Myers, Richard L., 4,151,414, Cl. 250-281.000.

Exxon Production Research Company: *See—*
Orr, Willis P., 4,150,477, Cl. 29-526.00R.

Exxon Research & Engineering Co.: *See—*
Allan, David E.; and Lewis, William E., 4,151,070, Cl. 208-59.000.
Duvdevani, Ilan; and Bock, Jan, 4,151,137, Cl. 260-23.50A.
Eberly, Paul E., Jr., 4,151,115, Cl. 252-434.000.
Gladrow, Elroy M., 4,151,119, Cl. 252-455.00Z.
Gladrow, Elroy M., 4,151,121, Cl. 252-455.00Z.
Oswald, Alexis A.; and Murrell, Lawrence L., 4,151,114, Cl. 252-430.000.
Rossi, Albert, 4,151,069, Cl. 208-33.000.
Smith, Dean L., Jr.; and Tarmy, Barry L., 4,150,900, Cl. 366-302.000.
Thaler, Warren A., 4,151,113, Cl. 252-429.00R.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,151,343, Cl. 526-308.000.
Wristers, Harry J., 4,151,112, Cl. 252-429.00B.

Eyb, Wolfgang: *See—*
Hensler, Paul; Eyb, Wolfgang; Hetmann, Richard; and Burst, Hermann, 4,151,508, Cl. 340-64.000.

Fairchild Camera and Instrument Corporation: *See—*
Sander, Wendell B.; and Shepherd, William H., 4,151,540, Cl. 357-34.000.

Fairey Hydraulics Limited: *See—*
Fuell, Frederick J., 4,150,604, Cl. 91-216.00A.

Fang, Henry H., to Northwood Mills Ltd. Tall oil pitch based thermoplastic adhesive. 4,151,002, Cl. 106-123.0TQ.

Faris, Sadeg M., to International Business Machines Corporation. Superconducting memory array configurations which avoid spurious half-select condition in unselected cells of the array. 4,151,605, Cl. 365-162.000.

Farkas, Rudolf: *See—*
Cuenoud, Gerard; Farkas, Rudolf; Revillet, Georges; and Sanz, Manuel, 4,150,922, Cl. 417-45.000.

Farrar, Jerome A.: *See—*
Regelin, Donald H.; and Farrar, Jerome A., 4,150,817, Cl. 266-139.000.

Fava, Miguel. Unitary package for water treatment for attachment to home hot water heater. 4,151,090, Cl. 210-222.000.

Fayolle, Aime; and Rignon, Michel, to Metraplan Spaa - Societe Anonyme. Method of and apparatus for the localizing of security line faults for ski lifts and the like. 4,151,459, Cl. 324-52.000.

Federal Paper Board Company Inc.: *See—*
Engdahl, Arnold B., Jr., 4,150,778, Cl. 229-17.00R.

Feldstein, Nathan. Post colloid addition of catalytic promoters to non noble metal principal catalytic compounds in electroless plating catalysts. 4,151,311, Cl. 427-53.000.

Fell, Wolfgang; Zahn, Heinrich; and Gunschmann, Peter, to Robert Bosch GmbH. Guide roller construction for magnetic tape recording-/reproducing systems, and especially for video tape systems. 4,150,773, Cl. 226-196.000.

Feltzin, Joseph: *See—*
Chasin, David G.; and Feltzin, Joseph, 4,151,148, Cl. 260-29.6RB.

Fenneman, David B.; and Geres, Robert J., to United States of America, Navy. Laser pile cutter. 4,151,393, Cl. 219-121.00L.

Fennimore, Jack, to Smith & Nephew Pharmaceuticals Ltd. Packaging. 4,150,744, Cl. 206-205.000.

Fenton, Alvin P.: *See—*
Ganowsky, Raymond J.; and Fenton, Alvin P., 4,151,499, Cl. 335-272.000.

Fernandez, Carlos P. Two axes controller. 4,150,803, Cl. 244-135.00A.

Fernandez, Eugenio A.; and Chisholm, Edward E. System and apparatus for counting hanging garments. 4,151,402, Cl. 235-92.0PK.

Ferranti Limited: *See—*
Pitches, Brian E.; and Murray, Robert M. S., 4,150,767, Cl. 222-23.000.

Ferrara, Neil. Individual barbeque apparatus. 4,150,610, Cl. 99-419.000.

Ferro Corporation: *See—*
Douglass, Thomas E., 4,150,514, Cl. 51-298.000.

Fetheroff, Charles W., to TRW Inc. Computer controlled ultrasonic defect gate. 4,150,577, Cl. 73-611.000.

Fiat Societa per Azioni: *See—*
Gaggiano, Nicola; and Forlai, Giorgio, 4,150,655, Cl. 123-196.0AB.

Fields, Ellis K., to Standard Oil Company (Indiana). Oxidation catalyst and process. 4,151,213, Cl. 260-669.00R.

Fierro Esponja, S.A.: *See—*
Price-Falcon, Juan F.; MacKay, Patrick W.; Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, 4,150,972, Cl. 75-35.000.

Fikentscher, Rolf: *See—*
Perner, Johannes; Frey, Guenter; Helfert, Herbert; and Fikentscher, Rolf, 4,151,127, Cl. 252-542.000.

Filan, A. LaVerne: *See—*
Filan, Alton N.; and Filan, A. LaVerne, 4,150,723, Cl. 172-225.000.

Filan, Alton N.; and Filan, A. LaVerne. Rollover apparatus for plows. 4,150,723, Cl. 172-225.000.

Filipovich, Danny, to Bell & Howell Company. Closed loop automatic focusing unit. 4,150,888, Cl. 354-25.000.

Fink, Peter: *See—*
Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, 4,150,719, Cl. 165-140.000.

Firestone Tire & Rubber Company, The: *See—*
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,151,222, Cl. 260-857.00G.

Fischer, Heinz: *See—*
Sackmann, Gunter; Kolb, Gunter; Fischer, Heinz; and Muller, Friedhelm, 4,151,336, Cl. 526-15.000.

Fischman, Martin: *See—*
Hallett, Joseph L.; and Fischman, Martin, 4,151,497, Cl. 335-213.000.

Fisons Limited: *See—*
Appleton, Richard A.; and Brown, Kevan, 4,151,179, Cl. 260-345.200.
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,151,292, Cl. 424-273.00P.

Fite, Wade L.; and Myers, Richard L., to Extranuclear Laboratories, Inc. Method and apparatus for detection of extremely small particulate matter and vapors. 4,151,414, Cl. 250-281.000.

Fitts, Fred E., III; and Batteas, J. D., to DND Teletronics, Inc. Message registration pulse generator. 4,151,372, Cl. 179-7.10R.

Fitzpatrick, Gary O.; and Britt, Edward J., to United States of America, Energy. Distributed electrical leads for thermionic converter. 4,151,438, Cl. 310-306.000.

Fleischer, Henry. Clamping device. 4,150,846, Cl. 285-87.000.

Flick, Carl, to Electric Power Research Institute, Inc. Cooled spiral winding for electrical rotating machine stator. 4,151,433, Cl. 310-54.000.

Fluid Measurement Systems, Inc.: *See—*
Halpine, Joseph C., 4,150,694, Cl. 137-625.470.

FMC Corporaton: *See—*
Roberts, Thomas E., Jr.; Wiederrich, James L.; Lill, Melvin H.; and Chang, Andrew K., 4,150,897, Cl. 356-152.000.

Fock, Jurgen; and Buhler, Helmut, to Th. Goldschmidt AG. Manufacture of coated split-resistant improvement webs from paper having unit weight 60 g/m². 4,151,315, Cl. 427-258.000.

Ford Motor Company: *See—*
Boyer, Curtis E.; and Mosier, Jacques, 4,151,466, Cl. 324-166.000.

Cermak, Michael J.; and Merchant, Stanley R., 4,151,503, Cl. 338-14.000.
Gropp, Karl H., 4,150,649, Cl. 123-119.00A.
Janotik, Adam M., 4,151,455, Cl. 322-48.000.
Nielsen, Arnold D., 4,150,562, Cl. 73-27.00R.

Forlai, Giorgio: *See—*
Gaggian , Nicola; and Forlai, Giorgio, 4,150,655, Cl. 123-196.0AB.

Forschirm, Alex S.: *See—*
Rosenthal, Arnold J.; Forschirm, Alex S.; and Barnes, Bruce P., 4,151,327, Cl. 428-254.000.

Foseco International Limited: *See—*
Washbourne, Colin; and Edwards, Bryan W., 4,150,849, Cl. 294-19.00R.

Foss, Robert P.: *See—*
Chambers, William J.; and Foss, Robert P., 4,150,989, Cl. 96-35.100.

Foulis, Michael J.: *See—*
Dawson, William; Foulis, Michael J.; Gutteridge, Norman J. A.; and Smith, Colin W., 4,151,199, Cl. 562-504.000.

Fox, Kenneth L., Jr., to Mid-America Sweeteners, Inc. Method and system for handling bulk shipments of a flowable product. 4,150,700, Cl. 141-11.000.

Fox, Lawrence E.; Groff, Eugene R.; and Wright, Paul L., to Caterpillar Tractor Co. Tensioned cushioning lug for track-type vehicles. 4,150,858, Cl. 305-57.000.

Franzmair, Rudolf: *See—*
Menzl, Kurt; and Franzmair, Rudolf. 4,151,164, Cl. 260-239.950.

Frazier, Charles: *See—*
Hug, Leonard F.; Uba, Toshio; Frazier, Charles; and Varga, John F., 4,151,331, Cl. 429-94.000.

Frey, Donald J.; and Hamilton, Thomas B., to Combustion Engineering, Inc. Coal fired furance. 4,150,631, Cl. 110-186.000.

Frey, Guenter: *See—*
Perner, Johannes; Frey, Guenter; Helfert, Herbert; and Fikentscher, Rolf, 4,151,127, Cl. 252-542.000.

Fricke, Jobst; Voigt, Wolfgang; and Schmitz, Jurgen, to CMB Colonia Management- und Beratungsgesellschaft mbH & Co. KG. Music synthesizer with breath-sensing modulator. 4,151,368, Cl. 179-1.00M.

Fried. Krupp GmbH: *See—*
Keldenich, Josef, 4,150,628, Cl. 105-367.000.

Friedheim, Ernst A. H. Arsenamide compound. 4,151,188, Cl. 260-440.000.

Friedman, Ronald L.; and Lewis, Roger N., to Argus Chemical Corporation. Perester-acyl sulfonyl peroxide co-initiator for vinyl polymerization. 4,151,339, Cl. 526-204.000.

Friedrich, Herbert H. Quick connect assembly. 4,150,908, Cl. 403-341.000.

Friedrich, Ludwig: *See—*
Albrecht, Hans P.; Friedrich, Ludwig; and Zimmermann, Frank, 4,151,277, Cl. 424-180.000.

Fruehauf Corporation: *See—*
Banerjea, Tara N.; and Ringe, Stephen J., 4,150,840, Cl. 280-429.000.

Frutiger, Peter, to Anstalt Europaische Handelsgesellschaft. Apparatus equipped with a transmitting and receiving station for generating, converting and transmitting signals. 4,151,469, Cl. 325-38.00R.

Fry, Raymond R., Jr., to United States of America, Army. Method for preparing a smoke agent. 4,151,233, Cl. 264-3.00B.

Fuell, Frederick J., to Fairey Hydraulics Limited. Biased pressure feedback module. 4,150,604, Cl. 91-216.00A.

Fuji Photo Optical Co., Ltd.: *See—*
Tobioka, Takashi, 4,150,881, Cl. 352-27.000.

Fuji Xerox Co., Ltd.: *See—*
Kikuchi, Yoshiki, 4,151,599, Cl. 365-3.000.
Takenouchi, Mutsuo, 4,151,604, Cl. 365-109.000.

Fujinami, Akira: *See—*
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, 4,151,290, Cl. 424-273.00R.

Fujitsu Limited: *See—*
Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, 4,151,542, Cl. 357-36.000.

Fukuda, Takeshi: *See—*
Itoh, Kunio; and Fukuda, Takeshi, 4,151,156, Cl. 260-37.0SB.

Fukuhara, Akinobu: *See—*
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,150,716, Cl. 165-1.000.

Fukuhara, Takeshi; and Miura, Yuji, to Hitachi, Ltd. Bus connection detector circuit for bus connection matrix circuit. 4,151,374, Cl. 179-18.0GF.

Fukuma, Nobuo; Kato, Yoshito; and Nogami, Kouji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Protective means for feeder of machinery with DC-motor. 4,151,450, Cl. 318-317.000.

Fukumori, Yoshiki: *See—*
Yamakawa, Yoshio; and Fukumori, Yoshiki, 4,150,541, Cl. 60-276.000.

Fukumoto, Mitsunobu: *See—*
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.

Fukuoka, Tatsuo. Method for manufacturing a footwear and footwear. 4,150,455, Cl. 12-142.0RS.

Fulier, Jozef, to Vyskumny ustav mechanizacie a automatizacie. Blind riveting unit. 4,150,555, Cl. 72-114.000.

Full, Elliott D. Portable self-contained alarm with remote triggering capability. 4,151,520, Cl. 340-528.000.

Fuller, David L. Humidity sensing device. 4,150,570, Cl. 73-335.000.

Funada, Fumiaki; and Kuwagaki, Hiroshi, to Sharp Kabushiki Kaisha. Holding plate for liquid crystal. 4,151,326, Cl. 428-447.000.

Funston, David L.; and Milburn, Zachariah H., Jr., to GTE Sylvania Incorporated. Digital gain control system. 4,151,481, Cl. 330-279.000.

Furukawa, Tsuneo: *See—*
Shioi, Hideji; Furukawa, Tsuneo; Kouchi, Hiroaki; and Nishimatsu, Kazuo, 4,150,936, Cl. 425-397.000.

Furushima, Masakazu: *See—*
Tsuchiya, Hideshi; Takamatsu, Tetsuo; Furushima, Masakazu; and Hojo, Shiro, 4,150,966, Cl. 71-78.000.

Fusion Incorporated: *See—*
Lee, Irene W. H., 4,151,016, Cl. 148-24.000.

G. D. Searle & Co.: *See—*
Collins, Paul W.; and Pappo, Raphael, 4,151,187, Cl. 260-429.700.
Stebbing, Nowell; and Eaton, Michael A., 4,151,350, Cl. 536-29.000.

G. Siempelkamp GmbH & Co., Firma: *See—*
Dischler, Helmut; Huydts, Eduard; and Lohmann, Gert, 4,150,739, Cl. 192-107.00R.

Gabler, Rolf: *See—*
Abthoff, Joerg; Schuster, Hans-Dieter; and Gabler, Rolf, 4,150,954, Cl. 48-102.00A.

Gabrys, Kenneth F., to Pentaject Corporation, The. Injection molding apparatus with quick change molds. 4,150,931, Cl. 425-186.000.

Gabuev, Georgy K.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.

Gaggiano, Nicola; and Forlai, Giorgio, to Fiat Societa per Azioni. Lubricating oil sump for intern. combustion engines. 4,150,655, Cl. 123-196.0AB.

Galeotti, Massimo: *See—*
Malerba, Mario; and Galeotti, Massimo, 4,151,500, Cl. 336-185.000.

Gancy, Alan B.: *See—*
Poncha, Rustom P.; and Gancy, Alan B., 4,151,261, Cl. 423-206.00T.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,151,288, Cl. 424-270.000.
Durant, Graham J.; and Ganellin, Charon R., 4,151,289, Cl. 424-273.00R.

Ganowsky, Raymond J.; and Fenton, Alvin P. Rotary solenoid with indirectly coupled output shaft. 4,151,499, Cl. 335-272.000.

Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Araliphatic dihalogen compounds composition and method of use. 4,151,302, Cl. 424-317.000.

Gante, Joachim: *See—*
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, 4,151,294, Cl. 424-283.000.

Garner, Lloyd L.; Herrick, George R.; and Harris, Charles R., to Smith International, Inc. Rock drill bit inserts with hollow bases. 4,150,728, Cl. 175-374.000.

Gasser, Hermann; and Curiger, Karl, to Luwa AG. Apparatus for monitoring yarn travel at a multiple spindle spinning machine. 4,150,533, Cl. 57-265.000.

Gast, Uwe; and Taudt, Heinz, to Dr. Ing. Rudolf Hell GmbH. Arrangement for the recording of rastered half tone pictures to avoid striping. 4,151,563, Cl. 358-298.000.

Gates Rubber Company, The: *See—*
Hug, Leonard F.; Uba, Toshio; Frazier, Charles; and Varga, John F., 4,151,331, Cl. 429-94.000.

Gatzemann, Uwe: *See—*
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Gaus, Hermann: *See—*
Helmer, Josef; and Gaus, Hermann, 4,150,543, Cl. 60-403.000.

Gavin, Edmond P., Jr., to Olin Corporation. Insulation fastening assembly. 4,150,465, Cl. 24-85.00B.

Geall, Charles L.; Leese, Leonard; Nicholas, Donald C.; Smith, Gordon C. R.; and Stokes, Geoffrey F., to Bakelite Xylonite Limited. Plastics shaped articles. 4,151,159, Cl. 260-42.460.

Geary, Daniel C.; and Krevald, Helga, to American Cyanamid Company. Wax-like antiperspirant stick compositions. 4,151,272, Cl. 424-68.000.

Gehorschutzcenter Wilhelm und Claus-Dieter Harms GmbH: *See—*
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Geisel, Jacob C., Jr.: *See—*
Schramm, Eugene J.; and Geisel, Jacob C., Jr., 4,150,617, Cl. 100-117.000.

General Corporation, The: *See—*
Sugihara, Yasumasa, 4,151,553, Cl. 358-44.000.

General Dynamics Corporation: *See—*
Goad, Robert C.; Krohn, Fritz F. W.; and Peddie, Gerald D., 4,151,031, Cl. 156-201.000.
Roden, William A.; and Criger, Glenn L., 4,150,775, Cl. 228-50.000.

General Electric Company: *See—*
Berger, Eugene L.; and Ringo, Marion M., 4,150,568, Cl. 73-151.000.
Betts, Joseph E.; Bruhin, Alfred C.; and Hoeppner, Robert P., 4,151,366, Cl. 174-116.000.
Collett, Wells I., 4,150,546, Cl. 60-644.000.
Crawford, John G., 4,150,688, Cl. 137-562.000.

Crivello, James V., 4,150,988, Cl. 96-35.100.
Crivello, James V.; and Lam, Julia H. W., 4,151,175, Cl. 260-326.260.
Cushing, Donald S.; and Jenkins, Thomas E., 4,150,679, Cl. 134-104.000.
Davenport, John M.; and Diamond, Michael N., 4,151,445, Cl. 315-92.000.
Johnson, Joseph F., 4,151,576, Cl. 361-35.000.
Kemp, Charles L., 4,150,607, Cl. 99-279.000.
Morelock, Charles R., 4,150,998, Cl. 106-44.000.
Pohl, Walter J., 4,150,558, Cl. 72-367.000.
Rhoades, John M.; and Montanino, Patrick J., 4,151,547, Cl. 357-81.000.
Sigsbee, Raymond A., 4,151,329, Cl. 428-607.000.
Sigsbee, Raymond A., 4,151,330, Cl. 428-607.000.
Smith, Chester A., 4,151,436, Cl. 310-215.000.
Stark, William H., 4,151,430, Cl. 310-90.000.
Woodmansee, Donald E., 4,150,953, Cl. 48-71.000.

General Mills, Inc.: *See—*
Yueh, Mao H.; Daravingas, George V.; Rigelhof, Fred J.; and Mueller, Herman W., 4,151,307, Cl. 426-549.000.

General Motors Corporation: *See—*
Atkins, Larry P.; and Bish, James R., 4,150,714, Cl. 164-440.000.
Ayotte, Richard F.; and Jones, Trevor O., 4,150,841, Cl. 280-446.00R.
Demido, Michael, 4,150,855, Cl. 303-22.00R.
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,151,435, Cl. 310-154.000.
Reid, Kenneth H.; Jarski, William C.; Boymer, George W.; and Heidenreich, Clifford E., 4,150,843, Cl. 280-744.000.

General Tire & Rubber Company, The: *See—*
Jellison, Frank R., 4,151,035, Cl. 156-415.000.

Genevey, Jacques; and Vincendon, Jean, to Alsthom-Atlantique. Adjustable loss-of-head valve. 4,150,693, Cl. 137-625.300.

Gentili, Vittorio, to Wrapmatic S.p.A. Automatic machine for packing products of parallelepiped shape, particularly reams of paper. 4,150,523, Cl. 53-535.000.

Gentry, David R.: *See—*
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,151,023, Cl. 156-62.200.

Geosource Inc.: *See—*
Mayne, William H.; Badger, Algernon S.; and Hawes, William S., deceased, 4,151,504, Cl. 340-15.5MC.

Geres, Robert J.: *See—*
Fenneman, David B.; and Geres, Robert J., 4,151,393, Cl. 219-121.00L.

Gerkema, Jan; and Koel, Gerrit J., to U.S. Philips Corporation. Magnetic head using a magnetic field-sensitive element and method of manufacturing same. 4,151,574, Cl. 360-113.000.

Gerzon, Michael A., to National Research Development Corporation. Sound reproduction systems. 4,151,369, Cl. 179-1.0GQ.

Gidaspow, Dimitri; Hariri, Hossein; and Arastoopour, Hamid, to Institute of Gas Technology. Sorbent composition and process for preparing it. 4,151,124, Cl. 252-474.000.

Gilleland, Randall C.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,151,388, Cl. 219-69.00C.

Gimovsky, Arlene J., to Union Carbide Corporation. Adsorption columns for use in radioimmunoassays. 4,151,254, Cl. 422-71.000.

Giulini, Luciano, to Cartec Costruzione Articoli Tecnici di Luciano Giulini. Gutter structure. 4,150,515, Cl. 52-12.000.

GKN Sankey Limited: *See—*
Golding, Cyril G., 4,150,771, Cl. 222-400.700.

Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon conversion catalyst. 4,151,119, Cl. 252-455.00Z.

Gladrow, Elroy M., to Exxon Research & Engineering Co. Hydrocarbon conversion catalyst containing a co-oxidation promoter. 4,151,121, Cl. 252-455.00Z.

Gladstein, Leo A., to International Business Machines Corporation. Precharged FET ROS array. 4,151,603, Cl. 365-104.000.

Gladwin, Inc.: *See—*
Blomeyer, Earle B.; Watson, William O.; and Richardson, Charles T., Jr., 4,151,380, Cl. 179-148.00R.

Glory Kogyo Kabushiki Kaisha: *See—*
Douno, Syugo, 4,150,740, Cl. 194-4.00C.

Goad, Robert C.; Krohn, Fritz F. W.; and Peddie, Gerald D., to General Dynamics Corporation. Apparatus for continuously forming composite shapes. 4,151,031, Cl. 156-201.000.

Goethals, Rafael A. J.: *See—*
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and van der Sijpt, Gerardus F., 4,150,965, Cl. 71-27.000.

Gogovic, Peter: *See—*
Heller, Heinz; Brand, Winfried; and Gogovic, Peter, 4,150,940, Cl. 431-130.000.

Goldin, Vladimir A.: *See—*
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Golding, Cyril G., to GKN Sankey Limited. Beer keg tapping closure units. 4,150,771, Cl. 222-400.700.

Goldman, Ernest A.; and Wasserman, Moe S., to GTE Laboratories Incorporated. Gate electrode for MNOS semiconductor memory device. 4,151,537, Cl. 357-23.000.

Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A. Medicinal preparation for the treatment of collagenoses of a rheumatoid nature. 4,151,281, Cl. 424-251.000.

Gonnella, Sebastian: *See—*
Kaplan, Richard B.; and Gonnella, Sebastian, 4,150,905, Cl. 401-215.000.

Goodpasture, Inc.: *See—*
Ethington, Donald, 4,151,265, Cl. 423-396.000.

Goodyear Tire & Rubber Company, The: *See—*
Hillegass, Donald V., 4,151,345, Cl. 528-56.000.
Williams, Larry J.; and Brhel, Alvin A., 4,150,745, Cl. 206-303.000.

Gordon, Gerald A., to Continental Group, Inc., The. Composite can. 4,150,747, Cl. 206-603.000.

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Lloyd, Samuel H., III; and Goren, Yoram, 4,150,635, Cl. 114-61.000.

Gosteli, Jacques, to Ciba-Geigy AG. Process for the manufacture of indigoid dyes. 4,151,170, Cl. 260-323.000.

Goth, George R., to International Business Machines Corporation. Forming adjacent impurity regions in a semiconductor by oxide masking. 4,151,010, Cl. 148-1.500.

Goto, Eiichi; Souma, Takashi; Idesawa, Masanori; and Yuasa, Tetsuo, to Rikagaku Kenkyusho; and Nihon Denshi Kabushiki Kaisha. Electron beam exposure method. 4,151,422, Cl. 250-492.00A.

Goto, Nobutaka; and Daidoji, Hiroshi, to Chlorine Engineers Corp., Ltd. Process for producing sodium hypochlorite. 4,151,052, Cl. 204-95.000.

Gould Inc.: *See—*
Maake, Douglas H., 4,151,398, Cl. 219-374.000.
Maldavs, Ojars, 4,150,691, Cl. 137-614.030.
Rys, Tadeusz J.; and DiMarco, Bernard, 4,151,495, Cl. 335-26.000.

Grancoin, Bernard, to Thomson-CSF. System employing a magneto-sensitive element for producing an electric signal in synchronism with the periodic movement of a part and application thereof in internal combustion engines. 4,150,653, Cl. 123-148.00E.

Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, to Saint-Gobain Industries. Mirror mounting. 4,150,874, Cl. 350-292.000.

Greco, Alberto: *See—*
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,151,110, Cl. 252-429.00C.

Greskovich, Eugene J.: *See—*
Ciuryla, Vincent T.; and Greskovich, Eugene J., 4,151,263, Cl. 423-242.000.

Gretag Aktiengesellschaft: *See—*
Meyer, Armin; Muller, Jorg; Brandli, Bruno; and Wahli, Robert, 4,150,894, Cl. 355-38.000.
Widmer, Walter R.; Klemenz, Hans-Jorg; and Schmid, Pierre, 4,151,373, Cl. 179-15.0AF.

Grier, William R.: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,150,901, Cl. 400-4.000.

Griesinger, Rolf; and Rienhardt, Manfred, to Spindelfabrik Sussen Schurr, Stahlecker & Grill GmbH. Draw frame device for spinning machines. 4,150,462, Cl. 19-294.000.

Griffith, John D., to Bonas Machine Company Limited. Patterning means. 4,150,698, Cl. 139-55.100.

Grimm, Thomas; and Ewald, Douglas, to Teledyne Industries, Inc. Portable water filter. 4,151,092, Cl. 210-256.000.

Grinblat, Mark P.: *See—*
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Groff, Eugene R.: *See—*
Fox, Lawrence E.; Groff, Eugene R.; and Wright, Paul L., 4,150,858, Cl. 305-57.000.

Grolman, Bernard: *See—*
Richards, William; and Grolman, Bernard, 4,150,471, Cl. 29-450.000.

Gropp, Karl H., to Ford Motor Company. Load responsive EGR valve. 4,150,649, Cl. 123-119.00A.

Grow, Bruce W.: *See—*
Grow, Harlow B., 4,151,067, Cl. 208-11.0LE.

Grow, Craig H.: *See—*
Grow, Harlow B., 4,151,067, Cl. 208-11.0LE.

Grow, Harlow B., to Grow, Craig H.; and Grow, Bruce W., part interest to each. Method and apparatus for acquisition of shale oil. 4,151,067, Cl. 208-11.0LE.

Grunberger, Lawrence W., to Izon Corporation. Point array sheet lighting apparatus. 4,151,582, Cl. 362-31.000.

Grundman, Aharon P. Instrument for tracing curved figures particularly ellipses. 4,150,487, Cl. 33-30.00R.

Gruner, Heiko: *See—*
Schnepf, Dietmar; Reindl, Klaus; Gruner, Heiko; and Vogel, Friedrich, 4,151,545, Cl. 357-71.000.

Gruppo Lepetit: *See—*
Sale, Amedeo O.; Pifferi, Giorgio; Consonni, Pietro; Diena, Alberto; and DelTurco, Bonaccorso R., 4,151,169, Cl. 260-308.00R.

GTE Laboratories Incorporated: *See—*
Goldman, Ernest A.; and Wasserman, Moe S., 4,151,537, Cl. 357-23.000.

GTE Sylvania Incorporated: *See—*
Buescher, William E., 4,151,440, Cl. 313-340.000.
Funston, David L.; and Milburn, Zachariah H., Jr., 4,151,481, Cl. 330-279.000.
Hallett, Joseph L.; and Fischman, Martin, 4,151,497, Cl. 335-213.000.
Manners, David E., 4,151,558, Cl. 358-190.000.
Patton, Robert J.; and Schrank, Martin P., 4,150,708, Cl. 164-72.000.
Puhak, Peter G., 4,151,441, Cl. 313-446.000.
Stetz, John W., 4,150,990, Cl. 96-36.100.

Guay, Bernard: *See—*
Debat, Jacques; Lemoine, Jean; Guay, Bernard; and Crescioni, Claude, 4,151,278, Cl. 424-195.000.

Gubelmann, Walter S., executor: *See—*
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,150,901, Cl. 400-4.000.

Gubelmann, William S., deceased; by Gubelmann, Walter S., executor; and Grier, William R., to R & I Patent Corporation. Justifying text writing composing machine. 4,150,901, Cl. 400-4.000.

Guedj, Richard: *See—*
Nguyen Huu, Duyet; Ballegeer, Jean-Claude; and Guedj, Richard, 4,151,597, Cl. 364-900.000.

Guerra-Garcia, Gilberto: *See—*
Price-Falcon, Juan F.; MacKay, Patrick W.; Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, 4,150,972, Cl. 75-35.000.

Gulf Oil Corporation: *See—*
Kirkpatrick, Joel L., 4,151,167, Cl. 260-306.80D.

Gulf Research & Development Company: *See—*
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,151,208, Cl. 260-601.00R.
Wu, Ching-Yong; and Swift, Harold E., 4,151,194, Cl. 260-464.000.

Gulf & Western Manufacturing Company: *See—*
Spanke, Edwin A.; and Carrieri, Louis F., 4,150,618, Cl. 100-257.000.

Gunschmann, Peter: *See—*
Fell, Wolfgang; Zahn, Heinrich; and Gunschmann, Peter, 4,150,773, Cl. 226-196.000.

Guntharp, Charles D.: *See—*
Berends, Emerson R.; and Guntharp, Charles D., 4,150,598, Cl. 83-478.000.

Gutsche, Henry W.; Bever, Thomas L.; and Hepperman, John T., to Monsanto Company. Twin blade mounting and tensioning apparatus. 4,150,912, Cl. 407-31.000.

Gutteridge, Norman J. A.: *See—*
Dawson, William; Foulis, Michael J.; Gutteridge, Norman J. A.; and Smith, Colin W., 4,151,199, Cl. 562-504.000.

H. B. Fuller Company: *See—*
Clausen, Victor H.; and Asbury, Charles E., Jr., 4,150,800, Cl. 242-131.000.

Hacker, Joseph M., to Western Electric Company, Inc. Filled service cable having corrugated shield and methods of making. 4,151,365, Cl. 174-107.000.

Hackney, Alfred C.: *See—*
Tandon, Sirjang L.; Hackney, Alfred C.; and Applequist, Roy A., 4,151,573, Cl. 360-104.000.

Hafele, Robert X., to Ethyl Corporation. Injection blow molding apparatus. 4,151,247, Cl. 264-328.000.

Hagert, Carl-Goran A. Prosthetic joint. 4,150,444, Cl. 3-1.910.

Haghino, Sadaaki: *See—*
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,151,432, Cl. 310-26.000.

Haid, Erich: *See—*
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,348, Cl. 536-27.000.
Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, 4,151,349, Cl. 536-28.000.

Haisma, Jan; Van Mierloo, Klaas L. L.; Enz, Ulrich E.; and Bongers, Piet F., to U.S. Philips Corporation. Magnetic bubble multilayer arrangement. 4,151,602, Cl. 365-32.000.

Hakkenberg, Peter; and Livesay, Richard E., to Caterpillar Tractor Co. One-piece track pin. 4,150,856, Cl. 305-11.000.

Halcon International, Inc.: *See—*
Onsager, Olav T., 4,151,197, Cl. 260-465.80D.

Halcon Research and Development Corporation: *See—*
Becker, Mitchell; and Sachs, Howard M., 4,151,048, Cl. 203-6.000.
McDermott, Joseph X., 4,151,116, Cl. 252-435.000.

Hale, Bruce H.: *See—*
Silkebakken, Jerrold W.; and Hale, Bruce H., 4,150,580, Cl. 74-5.00R.

Hall, Albert E.: *See—*
Trott, Lowell C.; and Hall, Albert E., 4,150,755, Cl. 414-11.000.

Hall, David E.: *See—*
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,151,292, Cl. 424-273.00P.

Hall, John B.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.

Hallett, Joseph L.; and Fischman, Martin, to GTE Sylvania Incorporated. Arc-resistant deflection yoke. 4,151,497, Cl. 335-213.000.

Halliburton Company: *See—*
Dill, Walter R.; and Knox, John A., 4,151,098, Cl. 252-8.55C.

Halmos, Imre A., to American Cyanamid Company. Resolution of N-acyl DL (+)-phenylalanines. 4,151,198, Cl. 260-501.110.

Halpine, Joseph C., to Fluid Measurement Systems, Inc. Rotary plug valve. 4,150,694, Cl. 137-625.470.

Hamada, Makoto; and Watanabe, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Front suspension for a motor vehicle. 4,150,842, Cl. 280-661.000.

Hamaguchi, Tomomitsu: *See—*
Tsutsui, Toshiaki; Oyamada, Akira; Hamaguchi, Tomomitsu; and Agata, Akihiko, 4,150,916, Cl. 415-143.000.

Hamer, Leslie C.: *See—*
Zuckerman, Matthew M.; and Hamer, Leslie C., 4,151,080, Cl. 210-59.000.

Hamilton, Raymond R., to American Hoechst Corporation. Method and apparatus for correcting printing plates. 4,150,623, Cl. 101-466.000.

Hamilton, Thomas B.: *See—*
Frey, Donald J.; and Hamilton, Thomas B., 4,150,631, Cl. 110-186.000.

Hammer, David H.: *See—*
Wieland, Howard N., Jr.; and Hammer, David H., 4,150,770, Cl. 222-146.0HE.

Hammer, Hansjorg, to Siemens Aktiengesellschaft. Method and apparatus for controlling one or several variables depending on several control inputs. 4,151,588, Cl. 364-106.000.

Hammond, Michael D. Bullet identification means. 4,150,624, Cl. 102-1.00M.

Hane, Toshioki: *See—*
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.

Hanes Corporation: *See—*
Northup, Francis B., 4,150,529, Cl. 57-6.000.

Hansen, Clyde A. Fixture for gas meter repair. 4,150,470, Cl. 29-401.00R.

Hansen, David R.: *See—*
St. Clair, David J.; and Hansen, David R., 4,151,057, Cl. 204-159.170.

Hansen, Robert B. Condensate-proof mirror. 4,150,869, Cl. 350-61.000.

Happel, John; and Hnatow, Miguel A., to American Gas Association, The. Sulfur resistant molybdenum catalysts for methanation. 4,151,191, Cl. 260-449.00M.

Harbottle, William E., to Timken Company, The. Adjusting process for bearings. 4,150,468, Cl. 29-148.40C.

Harco Corporation: *See—*
Seager, William H., 4,151,458, Cl. 324-9.000.

Hariri, Hossein: *See—*
Gidaspow, Dimitri; Hariri, Hossein; and Arastoopour, Hamid, 4,151,124, Cl. 252-474.000.

Harms, Claus D.: *See—*
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Harms, Wilhelm: *See—*
Bobertag, Gerhard; Dihse, Bernfried; Harms, Claus D.; Gatzemann, Uwe; and Harms, Wilhelm, 4,150,934, Cl. 425-305.100.

Harrington, Steven M.: *See—*
Harrington, Timothy M.; and Harrington, Steven M., 4,151,404, Cl. 235-92.0GA.

Harrington, Timothy M.; and Harrington, Steven M., to MDH Industries, Inc. Random digit generator. 4,151,404, Cl. 235-92.0GA.

Harris, Charles R.: *See—*
Garner, Lloyd L.; Herrick, George R.; and Harris, Charles R., 4,150,728, Cl. 175-374.000.

Harris Corporation: *See—*
Coleman, John R.; and Washburn, Clyde, 4,151,473, Cl. 328-134.000.
McRae, Daniel D., 4,151,491, Cl. 333-18.000.

Harrison, Frank B.; and Hornsby, Colin J., to Dexion-Comino International Limited. Safety gates. 4,150,510, Cl. 49-388.000.

Hart, Paul A. H.: *See—*
De Graaff, Hendrik C.; Hart, Paul A. H.; Schmitz, Albert; and Slotboom, Jan W., 4,151,006, Cl. 148-1.500.

Hart, Ronald L., to Dresser Industries, Inc. Electric furnace roof. 4,151,362, Cl. 13-35.000.

Hartung, Homer A.: *See—*
Osborne, J. Scott, Jr.; Hartung, Homer A.; and Bebbs, Joseph F., Jr., 4,150,677, Cl. 131-8.00R.

Hashimoto, Kenji: *See—*
Inada, Masami; Hashimoto, Kenji; and Suzuki, Yukio, 4,150,642, Cl. 123-119.00A.

Hashimoto, Yukio: *See—*
Morokawa, Shigeru; Sekiya, Fukuo; and Hashimoto, Yukio, 4,150,535, Cl. 58-23.00R.

Hasler, Werner; Lennemann, Eckart; and Padmanabhan, Subramaniam, to International Business Machines Corporation. Printer for different character densities. 4,150,619, Cl. 101-93.330.

Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, to Veba-Chemie Aktiengesellschaft. Method for the preparation of high melting C_4-hydrocarbon resins. 4,151,338, Cl. 526-185.000.

Hatakeyama, Takanobu: *See—*
Ohira, Takeshi; Kameyama, Tadao; Honzyo, Chihiko; Iwasa, Yuzaburo; and Hatakeyama, Takanobu, 4,150,734, Cl. 187-29.00R.

Hathaway, Richard A., to Ampex Corporation. Positionable transducer mounting structure using a piezoelectric bender element. 4,151,569, Cl. 360-77.000.

Hatsutori, Shoji: *See*—
Matsumoto, Yoshihisa; Yonekubo, Hiroaki; and Hatsutori, Shoji, 4,150,788, Cl. 237-8.00R.

Hauser, Raimund: *See*—
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Hawes, Louise A. M., administrator: *See*—
Mayne, William H.; Badger, Algernon S.; and Hawes, William S., deceased, 4,151,504, Cl. 340-15.5MC.

Hawes, William S., deceased: *See*—
Mayne, William H.; Badger, Algernon S.; and Hawes, William S., deceased, 4,151,504, Cl. 340-15.5MC.

Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, to Sharp Kabushiki Kaisha. Lead electrode structure for a semiconductor chip carried on a flexible carrier. 4,151,543, Cl. 357-65.000.

Hayashi, Yoshimasa: *See*—
Aoyama, Syunichi; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,150,646, Cl. 123-119.00A.

Hayashi, Yoshitsugu, to More Corporation. Handy snow plough. 4,150,501, Cl. 37-43.00B.

Hayes, Larry J., to Recognition Equipment Incorporated. Water base fluorescent ink for ink jet printing. 4,150,997, Cl. 106-15.050.

Hayes, Robert A.: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,151,222, Cl. 260-857.00G.

Hayes, Thomas E.; Emmons, Robert E.; and Bechtel, Jon H., to Johnson Service Company. Humidistat. 4,150,571, Cl. 73-336.500.

Hayes, William H., to Reliance Instrument Manufacturing Corp. Differential controller for positioning combustion system. 4,150,939, Cl. 431-76.000.

Haynes, Ben R., to Mobil Oil Corporation. Manually programmable audible alarm system. 4,151,514, Cl. 340-286.00R.

Hazelett, Robert W.; and Wood, John F. B., to Hazelett Strip-Casting Corporation. Method and apparatus for continuously casting metal slab, strip or bar with partial thickness integral lugs projecting therefrom. 4,150,711, Cl. 164-87.000.

Hazelett Strip-Casting Corporation: *See*—
Hazelett, Robert W.; and Wood, John F. B., 4,150,711, Cl. 164-87.000.

Heads Up Enterprises: *See*—
Sawasky, Herbert, 4,150,750, Cl. 209-664.000.

Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Corporation. Bis-(phenolic)diacetals. 4,151,211, Cl. 260-609.00F.

Hedberg, Frederick L.: *See*—
Arnold, Fred E.; and Hedberg, Frederick L., 4,151,358, Cl. 546-98.000.

Hedstrom Co.: *See*—
Bochmann, Carl E., 4,150,820, Cl. 272-86.000.

Heidenreich, Clifford E.: *See*—
Reid, Kenneth H.; Jarski, William C.; Boymer, George W.; and Heidenreich, Clifford E., 4,150,843, Cl. 280-744.000.

Heim, William P.: *See*—
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Heinemann Electric Company: *See*—
Nicol, Roland, deceased; and Robinson, Helen C. Nicol, executrix, 4,151,386, Cl. 200-303.000.

Heinrich, Eric C.; and Mosley, William H., Jr., to United States of America, Air Force. Nonlinearly variable gain apparatus. 4,151,478, Cl. 330-108.000.

Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick L., 4,151,103, Cl. 252-89.00R.

Heiser, Joachim; and Bernhardt, Wolfgang, to Robert Bosch GmbH. Hydraulic control arrangement for at least two hydraulic consumers. 4,150,690, Cl. 137-596.130.

Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; Miller, Robert G.; and Caterpillar Tractor Co. Engine and fuel shutdown control. 4,150,654, Cl. 123-179.00L.

Helfert, Herbert: *See*—
Perner, Johannes; Frey, Guenter; Helfert, Herbert; and Fikentscher, Rolf, 4,151,127, Cl. 252-542.000.

Helgesson, Carl O.; and Wallenius, Jan F. Method and mandrel for blind riveting. 4,150,467, Cl. 29-26.00B.

Helix International Limited: *See*—
Payton, Raymond A., 4,150,486, Cl. 33-27.00B.

Heller, Alwin: *See*—
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Leugering, Hans J.; and Heller, Alwin, 4,151,346, Cl. 528-230.000.

Heller, Heinz; Brand, Winfried; and Gogovic, Peter, to Ronson Gesellschaft mit beschrankter Haftung. Cigarette lighter. 4,150,940, Cl. 431-130.000.

Helm, Siegfried; and Leven, Peter, to Maschinenfabric Augsburg-Nurnberg Aktiengesellschaft. Method of producing heat-resistant parts. 4,151,017, Cl. 148-126.000.

Helmer, Josef; and Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Automatic change-speed transmission with a secondary servo-generator for the emergency supply of aggregates of the transmission control and shifting system operating with a servo-force. 4,150,543, Cl. 60-403.000.

Hendel, Frank J. Flowing saline water magnetohydrodynamic electric generator. 4,151,423, Cl. 290-42.000.

Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., to Imperial Chemical Industries Limited. Blends of acrylonitrile copolymers with graft copolymers containing rubber and acrylonitrile copolymer. 4,151,224, Cl. 260-876.00R.

Henke, Arno: *See*—
Klein, Erwin; Henke, Arno; and Zink, Hans, 4,151,548, Cl. 357-82.000.

Henley, Horace, Jr. Positive grip instrument pick. 4,150,601, Cl. 84-322.000.

Hensel, Paul C., to Post Office, The. Method for jointing of dielectric optical waveguides. 4,151,030, Cl. 156-158.000.

Hensler, Paul; Eyb, Wolfgang; Hetmann, Richard; and Burst, Hermann, to Porsche AG. Vehicle theft protection arrangement. 4,151,508, Cl. 340-64.000.

Hepperman, John T.: *See*—
Gutsche, Henry W.; Bever, Thomas L.; and Hepperman, John T., 4,150,912, Cl. 407-31.000.

Hercules Incorporated: *See*—
Smith, Vernon C., 4,151,216, Cl. 260-683.0PD.

Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., to Firestone Tire & Rubber Company, The. Amine terminated polymers and the formation of block copolymers. 4,151,222, Cl. 260-857.00G.

Herman, Frederick L.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Wet adhesion emulsions of polymer resins systems employed in water-based paint and coating compositions comprising as a component thereof monomer containing an ethylenic double bond and a ureido group polymerized therein. 4,151,142, Cl. 260-29.60R.

Hermans, Hubert K. Fr.: *See*—
Sanczuk, Stefan; and Hermans, Hubert K. Fr., 4,151,286, Cl. 424-267.000.

Herr, John A.: *See*—
Brown, Jack; Herr, John A.; Peterson, Wesley R.; and Wurst, John W., 4,150,634, Cl. 112-275.000.

Herrick, George R.: *See*—
Garner, Lloyd L.; Herrick, George R.; and Harris, Charles R., 4,150,728, Cl. 175-374.000.

Herring, Carrol: *See*—
Clark, V. Doyne, 4,150,460, Cl. 17-70.000.

Hess, Steven: *See*—
Northrup, Daniel; and Hess, Steven, 4.150,895, Cl. 355-74.000.

Hetmann, Richard: *See*—
Hensler, Paul; Eyb, Wolfgang; Hetmann, Richard; and Burst, Hermann, 4,151,508, Cl. 340-64.000.

Hewitt Soap Company Inc., The: *See*—
O'Roark, James R., 4,151,105, Cl. 252-145.000.

Hibarger, George E.; Hibarger, George G.; and Daniel, David W. Breakwater system. 4,150,909, Cl. 405-27.000.

Hibarger, George G.: *See*—
Hibarger, George E.; Hibarger, George G.; and Daniel, David W., 4,150,909, Cl. 405-27.000.

Hiesinger, Leopold, to Dr. Johannes Heidenhaln GmbH. High resolution recording medium and method for producing same. 4,151,321, Cl. 428-195.000.

Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, to Takeda Chemical Industries, Ltd. Method for producing maytansinol and its derivatives. 4,151,042, Cl. 195-96.000.

Higgins, Bobby L., to Camsco, Inc. Liquid jet cutting nozzle and housing. 4,150,794, Cl. 239-596.000.

Hilbrands, Hans A., to U.S. Philips Corporation. Box construction. 4,150,779, Cl. 229-44.00R.

Hildebrandt, William J., to Stanley Works, The. Shears with improved cutting action and method of making same. 4,150,484, Cl. 30-254.000.

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Hisasue, Michio: *See*—
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Uchino, Tetsuya; Hisasue, Michio; and Kojima, Hiroaki, 4,151,342, Cl. 526-273.000.

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Morinaga, Takashi; Okano, Yasuyuki; Kakefuda, Koichi; and Suzue, Kiyoyuki, 4,151,226, Cl. 260-881.000.

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Baba, Tatsuo, 4,151,479, Cl. 330-264.000.
Fukuhara, Takeshi; and Miura, Yuji, 4,151,374, Cl. 179-18.0GF.
Koyanagi, Mitsumasa; and Sato, Kikuji, 4,151,607, Cl. 365-174.000.

Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, 4,151,502, Cl. 338-2.000.
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Sasayama, Takao; Nishimiya, Torazo; and Sakamoto, Shinichi, 4,150,643, Cl. 123-119.0EC.
Sato, Kazuhiro; Ozawa, Naoki; and Nagahara, Shusaku, 4,151,552, Cl. 358-41.000.
Sayo, Kosaku; Tani, Seijiro; and Suginuma, Atsushi, 4,150,738, Cl. 192-84.00C.
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Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, 4,151,313, Cl. 427-98.000.

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Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Leugering, Hans J.; and Heller, Alwin, 4,151,346, Cl. 528-230.000.

Hoeppner, Robert P.: *See*—
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Hoffman-La Roche Inc.: *See*—
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Chan, Ka-Kong; and Saucy, Gabriel, 4,151,360, Cl. 560-95.000.
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Rosen, Perry, 4,151,196, Cl. 260-465.00F.
Spector, Sidney, 4,151,268, Cl. 424-1.000.

Hofmann, William E.; and Long, Alton W., to Owens-Illinois, Inc. Apparatus for coating glassware. 4,150,964, Cl. 65-181.000.

Hoggard, Anthony J., to Tomar Corporation. Arrowhead extractor. 4,150,469, Cl. 29-254.000.

Hogue, Maurice A. Motor protective device. 4,151,575, Cl. 361-33.000.

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Hokushin Electric Works, Ltd.: *See*—
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Theis, James V., Jr., 4,150,918, Cl. 415-202.000.

Holmes, Horace D. Locking fastener. 4,150,702, Cl. 151-22.000.

Holtschmidt, Ulrich: *See*—
Lurssen, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,150,967, Cl. 71-92.000.

Holuba, Henry J., to Montgomery Elevator Company. Reversal stop device. 4,151,381, Cl. 200-61.390.

Honda, Akira: *See*—
Miyake, Hiroshi; Tenma, Satoru; Sato, Nobuyoshi; and Honda, Akira, 4,150 975, Cl. 75-101.00R.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Breikss, Ivars P., 4,151,511, Cl. 340-146.200.
Kolbow, Donald P.; and Whitney, John M., 4,150,718, Cl. 165-12.000.
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Honeywell Information Systems Inc.: *See*—
Webster, Marvin K., 4,151,598, Cl. 364-900.000.

Honzyo, Chihiko: *See*—
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Hope, Henry F.; and Hope, Stephen F. Gear connecting arrangement. 4,150,589, Cl. 74-421.00R.

Hope, Stephen F.: *See*—
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Horiike, Yasuhiro: *See*—
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,151,034, Cl. 156-345.000.

Horn, George M.: *See*—
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Horn, Robert E.: *See*—
Williams, Maurice A.; Horn, Robert E.; and Bronikowski, John C., 4,151,306, Cl. 426-456.000.

Hornsby, Colin J.: *See*—
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Horrocks, Donald L.: *See*—
Aime, Clement P.; and Horrocks, Donald L., 4,151,412, Cl. 250-328.000.

Horvath, Louis T., to Samuel Moore and Company. Method of making an improved hose and tube coupling. 4,150,466, Cl. 29-417.000.

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Seib, Paul A.; Cousins, Raymond C.; and Hoseney, Russell C., 4,151,178, Cl. 260-343.700.

Hoshi, Hideaki: *See*—
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Hosoi, Takuji: *See*—
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Hospied, Jean J., to A. F. Stoddard & Co., Ltd. Apparatus for manufacturing fabric with non-woven pile. 4,151,026, Cl. 156-435.000.

Houli, Frederick H., to W. H. Booth & Co., Ltd. Method of producing sand mounds having a frozen surface. 4,150,704, Cl. 164-12.000.

Howard, Edward G., Jr.: *See*—
Adelman, Robert L.; and Howard, Edward G., Jr., 4,151,126, Cl. 252-508.000.

Howarth, William F., Jr. Visor mounted washer for goggles. 4,150,681, Cl. 134-172.000.

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Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.

Hubel, Werner: *See*—
Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, 4,151,338, Cl. 526-185.000.

Hubele, Adolf, to Ciba-Geigy Corporation. Microbicides for controlling plant diseases. 4,151,295, Cl. 424-285.000.

Hubele, Adolf, to Ciba-Geigy Corporation. Certain aniline derivatives as microbicidal agents. 4,151,299, Cl. 424-309.000.

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Hug, Leonard F.; Uba, Toshio; Frazier, Charles; and Varga, John F., to Gates Rubber Company, The. Offset perforated lead-acid battery grid. 4,151,331, Cl. 429-94.000.

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Platt, Vernon H.; and Wilmot, Richard D., 4,151,523, Cl. 343-5.0DP.

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Shepherd, William L., 4,150,727, Cl. 173-147.000.

Hundt and Weber, Schaltgerate GmbH: *See*—
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Hunter, James R.: *See*—
Lazzarotti, Sebastian J.; Bradshaw, Robert S.; and Hunter, James R., 4,150,743, Cl. 198-460.000.

Hunter, Wood E.; and Sieder, Theodore P., to Nalco Chemical Company. Preparation of diallyl dimethyl ammonium chloride and polydiallyl dimethyl ammonium chloride. 4,151,202, Cl. 260-567.60R.

Huntzinger, Elwood E.: *See*—
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Hupe, Gerard J., to Northern Telecom Limited. Differential charge sensing circuit for MOS devices. 4,151,429, Cl. 307-355.000.

Hurst, John W., to Chrysler Corporation. Drive couplings and clutches. 4,150,590, Cl. 74-780.000.
Husbands, George E. M., to American Home Products Corporation. Prostaglandin derivatives. 4,151,361, Cl. 562-503.000.
Huss, Robert C.: *See*—
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Hutec Corporation: *See*—
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I.S.C. Chemicals Limited: *See*—
Slinn, David S. L.; and Plummer, Noel, 4,150,493, Cl. 34-9.000.
Ichikawa, Hachiro: *See*—
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Ichikawa, Yataro; Yoshisato, Eishin; and Nakagawa, Koji, to Teijin Limited. Process for preparing amino alcohols. 4,151,204, Cl. 260-584.00R.
Ichimura, Masahiko; Miyake, Haruhisa; Kodama, Shun-ichi; and Hisasue, Michio, to Asahi Glass Company Ltd. Process for producing fluorocopolymer. 4,151,340, Cl. 526-249.000.
ICI Americas Inc.: *See*—
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Idemitsu Kosan Co., Ltd.: *See*—
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Iemura, Nobukazu: *See*—
Akatsuka, Hisashi; Naniwa, Kiyoaki; Iemura, Nobukazu; and Ishida, Kazufumi, 4,151,118, Cl. 252-439.000.
Iida, Mikio; and Hosoya, Mitsuru, to Sony Corporation. Television receiver operating mode selector. 4,151,557, Cl. 358-188.000.
Iida, Toshiharu, to Kabushiki Kaisha Aichi Denkikosakusho. Remaining capacity detector of a battery. 4,151,454, Cl. 320-48.000.
Iimura, Seiji: *See*—
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Iinuma, Kazuhiro; and Abe, Yukito, to Tokyo Shibaura Electric Co., Ltd. Electronic digital thermometer. 4,150,573, Cl. 73-362.0AR.
Ikegami, Yoshio; Mukai, Yoshihumi; Satoh, Hidehumi; and Kondo, Koichi, to Kobe Steel, Ltd. Automatic winding machine for wire-like object. 4,150,801, Cl. 242-158.00R.
Ikenouchi, Kosaburo: *See*—
Sanuki, Shin-ichi; Ueda, Yuziro; Yoshida, Toru; Kume, Tomoaki; and Ikenouchi, Kosaburo, 4,150,973, Cl. 75-60.000.
Iliff, Charles E. Magneto to spark plug aircraft wiring harness. 4,150,865, Cl. 339-26.000.
Illinois Tool Works Inc.: *See*—
Tracy, Richard J., 4,150,464, Cl. 24-77.00R.
Imai, Yoshikiyo; and Agatahama, Syunichi, to Omron Tateisi Electronics Co. Stepping relay having a single mounting member. 4,151,496, Cl. 335-140.000.
Imaiida, Satoshi: *See*—
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Imaizumi, Shigetake; Yamada, Kazuo; and Katsumata, Katashi, to Mitsubishi Aluminum Kabushiki Kaisha. Aluminum alloy excellent in high-temperature sagging resistance and sacrificial anode property. 4,150,980, Cl. 75-146.000.
Imler, Vaughn R., to PPG Industries, Inc. Method and apparatus for restraining glass during tempering. 4,150,963, Cl. 65-114.000.
Imperial Chemical Industries Limited: *See*—
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Brackman, Derek S., 4,150,720, Cl. 165-170.000.
Eaton, David C., 4,151,028, Cl. 156-110.0MD.
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,151,224, Cl. 260-876.00R.
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Inada, Masami; Hashimoto, Kenji; and Suzuki, Yukio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Diaphragm-operated pressure control valve assembly. 4,150,642, Cl. 123-119.00A.
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Industrial Research Products, Inc.: *See*—
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Industrie Pirelli, S.p.A.: *See*—
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Mazzola, Mario, 4,151,565, Cl. 360-40.000.
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Inovex Corporation: *See*—
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Institut de Recherches Chimiques et Biologiques Appliquees: *See*—
Debat, Jacques; Lemoine, Jean; Guay, Bernard; and Crescioni, Claude, 4,151,278, Cl. 424-195.000.
Institut Elektrosvarki IM.E.O. Patona: *See*—
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.
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Gidaspow, Dimitri; Hariri, Hossein; and Arastoopour, Hamid, 4,151,124, Cl. 252-474.000.
International Business Machines Corporation: *See*—
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Cappa, Maurus, 4,151,425, Cl. 307-130.000.
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Gladstein, Leo A., 4,151,603, Cl. 365-104.000.
Goth, George R., 4,151,010, Cl. 148-1.500.
Hasler, Werner; Lennemann, Eckart; and Padmanabhan, Subramaniam, 4,150,619, Cl. 101-93.330.
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,151,420, Cl. 250-492.00A.
Laybourn, Robert J.; and Lynott, John J., 4,150,757, Cl. 414-107.000.
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Shattuck, Meredith D., 4,150,985, Cl. 96-1.00R.
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International Telephone and Telegraph Corporation: *See*—
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Watanabe, Yoshihide; Kitada, Keiji; Kuratani, Osamu; and Iriuchijima, Makoto, 4,151,220, Cl. 260-850.000.
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Ishikawa, Tatsuo; Konda, Shoichi; Iuchi, Toshiaki; and Ichikawa, Hachiro, to Nippon Light Metal Company Limited. Aluminum electrolytic cell. 4,151,061, Cl. 204-247.000.
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Isley, Ralph, to Standard Oil Company, The. Flow improvers for high nitrile copolymers. 4,151,151, Cl. 260-30.40N.
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Ito, Yoichiro, to United States of America, Health, Education and Welfare. Device for high efficiency continuous countercurrent extraction using a rotating helical tube. 4,151,089, Cl. 210-198.00C.
Itoh, Kunio; and Fukuda, Takeshi, to Shin-Etsu Chemical Co., Ltd. Mercapto group-containing silicone rubber compositions. 4,151,156, Cl. 260-37.0SB.
Itzkan, Irving; and Kung, Robert T. V., to Avco Everett Research Laboratory, Inc. Tunable alkali metallic vapor laser. 4,151,486, Cl. 331-94.50P.

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Ivanov, Vitaly D., administrator: *See*—
Vasiliev, Evgeny A.; Sirotinsky, Petr S.; Ivanov, Dmitry P., deceased; and Ivanov, Vitaly D., administrator, 4,150,979, Cl. 75-130.00R.

Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, to Meiji Seika Kaisha, Ltd. Process for production of maltopentaose and maltohexaose. 4,151,041, Cl. 195-31.00P.

Iwamoto, Sadayuki, to Denki Kagaku Kogyo Kabushiki Kaisha. Method for manufacture of ferrosilicon nitride. 4,150,999, Cl. 106-73.500.

Iwasa, Yuzaburo: *See*—
Ohira, Takeshi; Kameyama, Tadao; Honzyo, Chihiko; Iwasa, Yuzaburo; and Hatakeyama, Takanobu, 4,150,734, Cl. 187-29.00R.

Iwasawa, Shigeo: *See*—
Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, 4,151,542, Cl. 357-36.000.

Izon Corporation: *See*—
Grunberger, Lawrence W., 4,151,582, Cl. 362-31.000.
Yevick, George J., 4,150,478, Cl. 29-527.200.
Yevick, George J., 4,150,876, Cl. 350-338.000.

J. H. Carruthers & Company Limited: *See*—
Cowan, William G., 4,150,625, Cl. 104-119.000.

Jablin, Richard. Treatment of waste liquor. 4,150,958, Cl. 55-70.000.

Jablonski, Edward F.: *See*—
Balke, George L.; and Jablonski, Edward F., 4,150,717, Cl. 165-9.100.

Jackman, Raymond W.: *See*—
Smee, Gordon E. A.; and Jackman, Raymond W., 4,150,613, Cl. 100-3.000.

Jackson, Isaac S., to National Catheter Corp. Endotracheal tubes with intubation direction control means. 4,150,676, Cl. 128-351.000.

Jackson, Jack M., to Brinadd Company. Clay-free wellbore fluid. 4,151,096, Cl. 252-8.50A.

Jackson, Richard R. Collapsible kite. 4,150,804, Cl. 244-153.00R.

Jacobs, Melvin J., to Triram Corporation. Method for waterproofing bridge decks and the like. 4,151,025, Cl. 156-71.000.

James, James R., to Accuratio Systems, Inc. Apparatus for metering, mixing and dispensing fluids. 4,150,769, Cl. 222-137.000.

James, Varnell L.: *See*—
Evelyn, George B.; and James, Varnell L., 4,150,802, Cl. 244-54.000.

Janata, Jiri, to Imperial Chemical Industries Limited. Compositions having protein reactive groups, membranes, electrodes coated with such compositions and chemical analysis methods. 4,151,049, Cl. 204-1.00T.

Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., to General Motors Corporation. Stator structure using forming curved wafer thin magnets from rare earth-cobalt alloy powders. 4,151,435, Cl. 310-154.000.

Janotik, Adam M., to Ford Motor Company. Divided housing unipolar dynamoelectric machine. 4,151,455, Cl. 322-48.000.

Janssen Pharmaceutica N.V.: *See*—
Sanczuk, Stefan; and Hermans, Hubert K. Fr., 4,151,286, Cl. 424-267.000.

Jansson, Erik L.; and Svensson, Tommy E., to Telefonaktiebolaget L M Ericsson. Controlling asynchronous conversion between analog and digital parameters. 4,151,518, Cl. 340-347.00C.

Japan Hydrazine Co., Inc.: *See*—
Tsuchiya, Hideshi; Takamatsu, Tetsuo; Furushima, Masakazu, and Hojo, Shiro, 4,150,966, Cl. 71-78.000.

Jarski, William C.: *See*—
Reid, Kenneth H.; Jarski, William C.; Boymer, George W.; and Heidenreich, Clifford E., 4,150,843, Cl. 280-744.000.

Jasper, Louis J., Jr., to United States of America, Army. Magnetic bubble traveling wave amplifier. 4,151,476, Cl. 330-43.000.

Jeanneret, Remy: *See*—
Lang, Walter; Jeanneret, Remy; and Kaiser, Anton, 4,150,947, Cl. 8-93.000.

Jellison, Frank R., to General Tire & Rubber Company, The. Building machine having an infinite number of drum settings. 4,151,035, Cl. 156-415.000.

Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., to Digital Equipment Corporation. Memory module with means for controlling internal timing. 4,151,593, Cl. 364-200.000.

Jenkins, Thomas E.: *See*—
Cushing, Donald S.; and Jenkins, Thomas E., 4,150,679, Cl. 134-104.000.

Jenness, Timothy A., to Tektronix, Inc. Voltage switching circuit for a color display system. 4,151,444, Cl. 315-1.000.

Jerva, Ronald E.: *See*—
Struger, Odo J.; Bremenour, Edwin L.; Burns, James F.; and Jerva, Ronald E., 4,151,580, Cl. 361-415.000.

Jewett, Warren R.; Theiss, John B.; and Adler, Lawrence, to University Patents, Inc. Anesthesia detector and display apparatus. 4,150,670, Cl. 128-188.000.

Johannessen, Paul R., to Megapulse, Incorporated. Method of and apparatus for unambiguous radio navigation. 4,151,528, Cl. 343-103.000.

John, Wolfgang W., to Concast Incorporated. Dummy bar handling apparatus and method. 4,150,710, Cl. 164-82.000.

Johnson, Everett A.: *See*—
Silverman, Daniel; and Johnson, Everett A., 4,150,781, Cl. 235-382.000.

Johnson, Howard R. Permanent magnet motor. 4,151,431, Cl. 310-12.000.

Johnson & Johnson: *See*—
Lindquist, Julius A., 4,150,572, Cl. 73-356.000.

Johnson, Joseph F., to General Electric Company. Transformer secondary disconnect and shorting switch. 4,151,576, Cl. 361-35.000.

Johnson, Marvin M.: *See*—
Nowack, Gerhard P.; Tabler, Donald C.; and Johnson, Marvin M., 4,151,072, Cl. 208-182.000.

Johnson, Philip P.; and Dingler, Geoffrey L., to Whirlpool Corporation. Dishwasher soil separator. 4,150,680, Cl. 134-104.000.

Johnson Service Company: *See*—
Hayes, Thomas E.; Emmons, Robert E.; and Bechtel, Jon H., 4,150,571, Cl. 73-336.500.

Johnston, Lyman C. Massage device. 4,150,668, Cl. 128-49.000.

Johrde, Paul S.: *See*—
Zona, Michael R.; Ruffing, Charles R.; and Johrde, Paul S., 4,151,434, Cl. 310-71.000.

Jones-Hinton, James, to Dunlop Limited. Method of making tennis balls. 4,151,029, Cl. 156-145.000.

Jones, Trevor O.: *See*—
Ayotte, Richard F.; and Jones, Trevor O., 4,150,841, Cl. 280-446.00R.

Joseph Bradbury & Sons Limited: *See*—
Smee, Gordon E. A.; and Jackman, Raymond W., 4,150,613, Cl. 100-3.000.

Josephson, Elliot: *See*—
Pease, Hugh R.; Agardy, Franklin J.; and Josephson, Elliot, 4,151,515, Cl. 340-309.100.

Josis, Christian R., to Centre de Recherches Metallurgiques Centrum Voor Research in de Metallurgie. Method of contacting liquid and gaseous phases. 4,150,957, Cl. 55-53.000.

Jouffret, Michel, to Rhone Poulenc, S.A. Process for the preparation of trimethyl-p-benzoquinone. 4,151,183, Cl. 260-396.00R.

Joy Manufacturing Company: *See*—
Etherington, Murray D.; and Roberts, David V., 4,150,603, Cl. 91-50.000.

Jubelin, Bernard J. L.: *See*—
Hoch, Rene G.; Jubelin, Bernard J. L.; Sarlat, Pierre M. A.; and Thomas, Pierre, 4,150,732, Cl. 181-213.000.

Judd, Henry E.: *See*—
Dowell, Arthur M.; and Judd, Henry E., 4,150,697, Cl. 138-118.100.

Juenemann, Werner: *See*—
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,150,943, Cl. 8-41.00R.

Julius Blum & Co., Inc.: *See*—
Thurnauer, William, 4,150,907, Cl. 403-234.000.

Kabel-und Metallwerke Gutenhoffnungshuette AG: *See*—
Ziemek, Gerhard; and Eilhardt, Bernd, 4,151,238, Cl. 264-45.500.

Kabirov, Albert G.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.

Kabushiki Kaisha Aichi Denkikosakusho: *See*—
Iida, Toshiharu, 4,151,454, Cl. 320-48.000.

Kabushiki Kaisha Asano Kenkyusho: *See*—
Asano, Kazuo, 4,150,930, Cl. 425-145.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Tsumura, Yuzo, 4,150,650, Cl. 123-140.00R.

Kagami, Teruyuki: *See*—
Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, 4,151,502, Cl. 338-2.000.

Kaganovsky, Gary P.: *See*—
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.

Kagerhuber, Franz; and Scheurecker, Werner, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Supporting and guiding means for cast strands. 4,150,715, Cl. 164-448.000.

Kaiser, Anton: *See*—
Lang, Walter; Jeanneret, Remy; and Kaiser, Anton, 4,150,947, Cl. 8-93.000.

Kakefuda, Koichi: *See*—
Morinaga, Takashi; Okano, Yasuyuki; Kakefuda, Koichi; and Suzue, Kiyoyuki, 4,151,226, Cl. 260-881.000.

Kaloi, Cyril M., to United States of America, Navy. End fed twin electric microstrip dipole antennas. 4,151,530, Cl. 343-700.0MS.

Kaloi, Cyril M., to United States of America, Navy. Asymmetrically fed twin electric microstrip dipole antennas. 4,151,531, Cl. 343-700.0MS.

Kaloi, Cyril M., to United States of America, Navy. Diagonally fed twin electric microstrip dipole antennas. 4,151,532, Cl. 343-700.0MS.

Kalopissis, Gregoire, to L'Oreal. Orally administered composition containing organic amine-organic acid addition salt for reducing excessive secretion of sebum on human skin and scalp. 4,151,301, Cl. 424-316.000.

Kamachi, Hajime: *See—*
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,151,352, Cl. 544-26.000.

Kamath, Venkatesh: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.

Kameda, Nobuyuki: *See—*
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, 4,151,290, Cl. 424-273.00R.

Kameyama, Tadao: *See—*
Ohira, Takeshi; Kameyama, Tadao; Honzyo, Chihiko; Iwasa, Yuzaburo; and Hatakeyama, Takanobu, 4,150,734, Cl. 187-29.00R.

Kan, Peter T.; and Cenker, Moses, to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams employing quaternary boron salts as catalysts. 4,151,334, Cl. 521-105.000.

Kanazawa, Yukio. Hair cutting device. 4,150,483, Cl. 30-133.000.

Kanoh, Natsuki; Tanaka, Toru; and Enokido, Nobuo, to Mitsubishi Chemical Industries Ltd. Process for preparing polyolefin. 4,151,337, Cl. 526-116.000.

Kansas State University Research Foundation: *See—*
Seib, Paul A.; Cousins, Raymond C.; and Hoseney, Russell C., 4,151,178, Cl. 260-343.700.

Kaplan, Daniel; and Velasco, Gonzalo, to Thomson-CSF. Method for manufacturing a layer of amorphous silicon usable in an electronic device. 4,151,058, Cl. 204-192.00S.

Kaplan, Donald A.; and Wilcox, Gary L., to University of California, The Regents of the. Horizontal slab gel electrophoresis. 4,151,065, Cl. 204-299.00R.

Kaplan, Leonard, to Union Carbide Corporation. Promoting n-propyl alcohol formation with vanadium compounds. 4,151,192, Cl. 260-449.00L.

Kaplan, Richard B.; and Gonnella, Sebastian, to Ultramet. Spheres obtained by vapor deposition for use in ball point pens. 4,150,905, Cl. 401-215.000.

Karger, Eva R.; and MacGregor, Paul T., to Polaroid Corporation. 1:1 Adducts of indole and (na)phthalaldehydic acid. 4,151,174, Cl. 260-326.13R.

Karl-Werner Schlueter G.m.b.H.: *See—*
Schlueter, Karl W.; and Schulz-Kaiser, Eckhard, 4,151,274, Cl. 424-80.000.

Karlsson, Stig O., to AB Karlstads Mekaniska Werkstad. Improvement in propeller blades. 4,150,914, Cl. 415-129.000.

Karstensen, Karl W., to Caterpillar Tractor Co. Variable geometry turbine nozzle. 4,150,915, Cl. 415-139.000.

Kaspers, Helmut: *See—*
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Kaspers, Helmut, 4,151,287, Cl. 424-269.000.

Kastening, Bertel; and Knittel, Dierk, to Kernforschungsanlage Julich Gesellschaft. Process for producing sulfones. 4,151,050, Cl. 204-59.00R.

Kataoka, Hiroshi. Method and device for controlling contact pressure on touch roller in sheet winder. 4,150,797, Cl. 242-67.10R.

Katayama, Hitoshi: *See—*
Segawa, Takashi; and Katayama, Hitoshi, 4,150,859, Cl. 308-23.500.

Kato, Toshiro: *See—*
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, 4,151,290, Cl. 424-273.00R.

Kato, Yoshito: *See—*
Fukuma, Nobuo; Kato, Yoshito; and Nogami, Kouji, 4,151,450, Cl. 318-317.000.

Katou, Tokuo: *See—*
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, 4,151,111, Cl. 252-429.00B.

Katsumata, Katashi: *See—*
Imaizumi, Shigetake; Yamada, Kazuo; and Katsumata, Katashi, 4,150,980, Cl. 75-146.000.

Katsurai, Makoto. Combined superconducting coil. 4,151,498, Cl. 335-216.000.

Kaufman, Edward; Picciotto, Frank; and Beck, Jack. Switch assembly for alarm systems. 4,151,382, Cl. 200-61.710.

Kavlico Corporation: *See—*
Bell, Robert L., 4,151,578, Cl. 361-283.000.

Kawagai, Kenji; Yoshida, Shigeki; and Nakada, Yasuo, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device having electrode-lead layer units of differing thicknesses. 4,151,546, Cl. 357-71.000.

Kawamoto, Mineo: *See—*
Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, 4,151,313, Cl. 427-98.000.

Kawamura, Kunio: *See—*
Ueda, Horoshi; Kawamura, Kunio; and Yamazaki, Keiji, 4,150,889, Cl. 354-37.000.

Keldenich, Josef, to Fried. Krupp GmbH. Transversely shiftable pivotally mounted schnabel car. 4,150,628, Cl. 105-367.000.

Keller, Douglas V., Jr.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,151,003, Cl. 106-278.000.

Keller, John H.; McKenna, Charles M.; and Winnard, James R., to International Business Machines Corporation. Apparatus for the formation of epitaxial layers doped with conductivity-determining impurities by ion deposition. 4,151,420, Cl. 250-492.00A.

Keller, Richard N.: *See—*
Pokorny, Joseph E.; and Keller, Richard N., 4,150,630, Cl. 108-64.000.

Keller, Robert A.: *See—*
Boor, Robert L., Jr.; Keller, Robert A.; and Kesinger, Donald E., 4,151,397, Cl. 219-216.000.

Kelley, Stephen H., to Motorola, Inc. Closed loop companding ratio control for continuously variabie slope delta modulation. 4,151,517, Cl. 340-347.00C.

Keltek Processing, Inc.: *See—*
Phillips, Patrick A., 4,150,977, Cl. 75-118.00P.

Kemlo, Kenneth G., to Broken Hill Proprietary Company, Limited, The. Indication of levels in receptacles. 4,150,974, Cl. 75-60.000.

Kemp, Charles L., to General Electric Company. Coffeemaker generator mounting. 4,150,607, Cl. 99-279.000.

Kemp, Klaus M.; and Lehman, Jack E., to Kemp Reduction Corporation. Pollutant removal from pyrolytic gases by centrifuge and molecular sieves. 4,150,548, Cl. 62-18.000.

Kemp Reduction Corporation: *See—*
Kemp, Klaus M.; and Lehman, Jack E., 4,150,548, Cl. 62-18.000.

Kenessey, Bela, to Bausch & Lomb, Inc. Multiple crystal holder assembly for wavelength dispersive X-ray spectrometers. 4,151,418, Cl. 250-442.000.

Kennametal Inc.: *See—*
Kita, John F., 4,150,476, Cl. 29-525.000.

Kennedy, Joseph P.: *See—*
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,151,343, Cl. 526-308.000.

Kernforschungsanlage Julich Gesellschaft: *See—*
Kastening, Bertel; and Knittel, Dierk, 4,151,050, Cl. 204-59.00R.

Kerr, Leslie I. Microphone holder attachment and switch control therefor. 4,151,468, Cl. 325-15.000.

Kervin, Willis D. Mixing valve and control system therefor. 4,150,684, Cl. 137-111.000.

Kesinger, Donald E.: *See—*
Boor, Robert L., Jr.; Keller, Robert A.; and Kesinger, Donald E., 4,151,397, Cl. 219-216.000.

Kessler, Ruth G. Means and method of bundling and stacking newspapers and the like. 4,150,612, Cl. 100-2.000.

Khanna, Sarwan K., to RCA Corporation. Molding composition. 4,151,132, Cl. 260-23.0XA.

Khokhulin, Vladimir N.; Ladygin, Jury V.; and Shver, Valery G., to Proizvodstvennoe Obiedinenie Turbostroenia Leningradsky Metallichesky Zavod. Device for finishing shaped surfaces with an abrasive tool. 4,150,511, Cl. 51-67.000.

Kibler, Lynden U., to Bell Telephone Laboratories, Incorporated. Phase locked loop indicator. 4,151,463, Cl. 324-82.000.

Kidd, Patrick D.: *See—*
Lee, Henry L., Jr.; Orlowski, Jan A.; and Kidd, Patrick D., 4,150,485, Cl. 32-15.000.

Kidwell, Roger L.; and Lynch, Gary J., to Monsanto Company. Preparation of acyl chlorides. 4,151,186, Cl. 269-429.300.

Kiefer, Siegfried: *See—*
Muller, Helmut, 4,150,809, Cl. 251-149.400.

Kight, Jack M., to W. R. Grace & Co. Self-welding laminate compositions. 4,151,328, Cl. 428-483.000.

Kikuchi, Yoshiki, to Fuji Xerox Co., Ltd. Magnetic bubble display units. 4,151,599, Cl. 365-3.000.

Killion, Mead C.: *See—*
Carlson, Elmer V.; and Killion, Mead C., 4,151,480, Cl. 330-277.000.

Kim, Leo; and Wald, Milton M., to Shell Oil Company. Process for methylation of olefins. 4,151,214, Cl. 260-676.00R.

Kimoto, Kyoji: *See—*
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.

Kincaid, Robert B.: *See—*
Druker, Leonard J.; and Kincaid, Robert B., 4,150,996, Cl. 106-2.000.

Kirkpatrick, Allen R., to Spire Corporation. Method involving pulsed light processing of semiconductor devices. 4,151,008, Cl. 148-1.500.

Kirkpatrick, Joel L., to Gulf Oil Corporation. 5-Acylamino-1,3,4-thiadiazole-2-sulfonamides. 4,151,167, Cl. 260-306.80D.

Kistner, Jerome L.: *See—*
Moorman, Charles J.; and Kistner, Jerome L., 4,150,784, Cl. 235-479.000.

Kita, John F., to Kennametal Inc. Method of mounting insert for mining tools and the like. 4,150,476, Cl. 29-525.000.

Kitada, Keiji: *See—*
Watanabe, Yoshihide; Kitada, Keiji; Kuratani, Osamu; and Iriuchijima, Makoto, 4,151,220, Cl. 260-850.000.

Kitamura, Tsuneo: *See—*
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.

Klein, Erwin; Henke, Arno; and Zink, Hans, to BBC Brown, Boveri & Company, Limited. Cooling container for cooling a semiconductor element. 4,151,548, Cl. 357-82.000.

Klemenz, Hans-Jorg: *See*—
Widmer, Walter R.; Klemenz, Hans-Jorg; and Schmid, Pierre, 4,151,373, Cl. 179-15.0AF.
Klingelhoefer, Hannsgeorg; and Mann, Friedrich, to Bielomatik Leuze & Co. Device for applying binding strips to the backs of layers of paper. 4,151,037, Cl. 156-477.00B.
Knap, Joseph, to Canadair Limited. Sliding doors and seals system for passenger vehicle. 4,150,509, Cl. 49-123.000.
Knepp, Gary L.: *See*—
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; Miller, Robert G.; and Caterpillar Tractor Co., 4,150,654, Cl. 123-179.00L.
Knickerbocker, Robert H., to Siemon Company, The. Pre-wired terminal connecting block. 4,150,867, Cl. 339-97.00P.
Knit-Fin Machinery Ltd.: *See*—
Aronoff, Edward I.; and McLay, William J., 4,150,948, Cl. 8-151.000.
Knittel, Dierk: *See*—
Kastening, Bertel; and Knittel, Dierk, 4,151,050, Cl. 204-59.00R.
Knorr, Robert H.: *See*—
Westendorf, Thomas H.; and Knorr, Robert H., 4,150,766, Cl. 221-112.000.
Knothe, Erich; and Berg, Christoph, to Sartorius Werke GmbH. Electromagnetically compensating weighing or force-measuring device. 4,150,730, Cl. 177-212.000.
Knox, John A.: *See*—
Dill, Walter R.; and Knox, John A., 4,151,098, Cl. 252-8.55C.
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, to Siemens Aktiengesellschaft. Liquid crystal display device. 4,150,877, Cl. 350-341.000.
Kobayashi, Masaaki: *See*—
Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, 4,151,542, Cl. 357-36.000.
Kobayashi, Shinsaku: *See*—
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, 4,151,357, Cl. 544-386.000.
Kobe Steel, Ltd.: *See*—
Ikegami, Yoshio; Mukai, Yoshihumi; Satoh, Hidehumi; and Kondo, Koichi, 4,150,801, Cl. 242-158.00R.
Kobylinski, Thaddeus P.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,151,208, Cl. 260-601.00R.
Kochs Adler AG: *See*—
Scholl, Hans, 4,150,489, Cl. 33-177.000.
Kodama, Shun-ichi: *See*—
Ichimura, Masahiko; Miyake, Haruhisa; Kodama, Shun-ichi; and Hisasue, Michio, 4,151,340, Cl. 526-249.000.
Koebner, Adolf. Process for the separation of unsaponifiable constituents from tall oil fatty acids. 4,151,160, Cl. 260-97.600.
Koel, Gerrit J.: *See*—
Gerkema, Jan; and Koel, Gerrit J., 4,151,574, Cl. 360-113.000.
Koeppel, Robert: *See*—
Bachelard, Roland; Barral, Robert; Lamalle, Maurice; and Koeppel, Robert, 4,151,000, Cl. 106-109.000.
Koga, Yoshio; Sumita, Tsuneyo; Inoue, Nobuo; and Matsuura, Susumu, to Tokyo Shibaura Electric Co., Ltd. Color television cathode ray tube. 4,151,442, Cl. 313-467.000.
Kojima, Hiroaki: *See*—
Uchino, Tetsuya; Hisasue, Michio; and Kojima, Hiroaki, 4,151,342, Cl. 526-273.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Azuma, Nobuhiro, 4,151,448, Cl. 318-138.000.
Kokusai Electric Company, Ltd.: *See*—
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.
Kolb, Gunter: *See*—
Sackmann, Gunter; Kolb, Gunter; Fischer, Heinz; and Muller, Friedhelm, 4,151,336, Cl. 526-15.000.
Kolbow, Donald P.; and Whitney, John M., to Honeywell Inc. Replacement thermostat adapter wall plate. 4,150,718, Cl. 165-12.000.
Konda, Shoichi: *See*—
Ishikawa, Tatsuo; Konda, Shoichi; Iuchi, Toshiaki; and Ichikawa, Hachiro, 4,151,061, Cl. 204-247.000.
Kondo, Koichi: *See*—
Ikegami, Yoshio; Mukai, Yoshihumi; Satoh, Hidehumi; and Kondo, Koichi, 4,150,801, Cl. 242-158.00R.
Kondo, Shinichi: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,151,347, Cl. 536-24.000.
Kondratovsky, Viktor S.: *See*—
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Konick, William L., to United States of America, Army. Identification code generator for high speed motion picture photography. 4,150,882, Cl. 352-39.000.
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Suga, Tsuneo; Ogi, Keiji; and Egami, Kenji, 4,150,993, Cl. 96-64.000.
Kopacz, Bernard F.: *See*—
Riuli, Arduino E.; and Kopacz, Bernard F., 4,150,845, Cl. 285-81.000.
Korte, Siegfried: *See*—
Lindner, Christian; Korte, Siegfried; El Sayed, Aziz; and Suling, Carlhans, 4,151,228, Cl. 260-898.000.
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Shioi, Hideji; Furukawa, Tsuneo; Kouchi, Hiroaki; and Nishimatsu, Kazuo, 4,150,936, Cl. 425-397.000.
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Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,150,890, Cl. 354-246.000.
Koyanagi, Mitsumasa; and Sato, Kikuji, to Hitachi, Ltd. Semiconductor memory device. 4,151,607, Cl. 365-174.000.
Krafthefer, Kerry M.; and Stipanuk, John M., to Molex Incorporated. Circuit board connector and means of mounting same. 4,150,863, Cl. 339-17.0LC.
Kramer, Wolfgang; Buchel, Karl Heinz; Brandes, Wilhelm; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Combating fungi with 1-diaryloxy-1-triazolyl-3,3-dimethyl-butan-2-ones and butan-2-ols. 4,151,287, Cl. 424-269.000.
Krapcho, John, to E. R. Squibb & Sons, Inc. Substituted amides and sulfonamides having antiinflammatory activity. 4,151,354, Cl. 544-159.000.
Kratz, Jerrold K.; and Christensen, Edward W., II, to RCA Corporation. Adjustable yoke mounting for in-line beam color television picture tube. 4,151,561, Cl. 358-248.000.
Krayenbuhl, Harold A.; Dolgonas, Gene; and Rogers, Charles J., to United States of America, Air Force. Rocket nozzle system. 4,150,540, Cl. 60-271.000.
Krevald, Helga: *See*—
Geary, Daniel C.; and Krevald, Helga, 4,151,272, Cl. 424-68.000.
Krofta, Milos, to Lenox Institute for Research. Stockwasher. 4,151,093, Cl. 210-386.000.
Krohn, Fritz F. W.: *See*—
Goad, Robert C.; Krohn, Fritz F. W.; and Peddie, Gerald D., 4,151,031, Cl. 156-201.000.
Kronman, Albert F.: *See*—
Peters, Melville F.; and Peters, Walter T., 4,150,660, Cl. 126-270.000.
Kropa, Gomer E., to Leesona Corporation. Pelletizing process. 4,151,251, Cl. 264-557.000.
Kropa, Gomer E.: *See*—
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Krueger, Hans: *See*—
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, 4,150,877, Cl. 350-341.000.
Kubota Ltd.: *See*—
Yano, Naomichi; Shinohara, Kazuhiro; and Sato, Joe, 4,150,933, Cl. 425-219.000.
Kudo, Ben B. Apparatus for shredding vegetation. 4,150,796, Cl. 241-101.100.
Kuehnle, Manfred R., to Coulter Stork U.S.A., Inc. Method and apparatus for sputtering multiple cylinders simultaneously. 4,151,059, Cl. 204-192.00R.
Kuehnle, Manfred R., to Coulter Stork U.S.A., Inc. Apparatus for sputtering cylinders. 4,151,064, Cl. 204-298.000.
Kumai, Seisaku: *See*—
Yamabe, Masaaki; and Kumai, Seisaku, 4,151,200, Cl. 260-544.00F.
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Sanuki, Shin-ichi; Ueda, Yuzir ; Yoshida, Toru; Kume, Tomoaki; and Ikenouchi, Kosaburo, 4,150,973, Cl. 75-60.000.
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Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, 4,151,543, Cl. 357-65.000.
Kung, Robert T. V.: *See*—
Itzkan, Irving; and Kung, Robert T. V., 4,151,486, Cl. 331-94.50P.
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Watanabe, Yoshihide; Kitada, Keiji; Kuratani, Osamu; and Iriuchijima, Makoto, 4,151,220, Cl. 260-850.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ozaki, Kiyoji; Fukuhara, Akinobu; Hosoi, Takuji; and Sagi, Yasuo, 4,150,716, Cl. 165-1.000.
Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, to Hitachi, Ltd. Semiconductor transducer. 4,151,502, Cl. 338-2.000.
Kurkov, Victor P., to Chevron Research Company. Process for the production of 2-pyrrolidone. 4,151,171, Cl. 260-326.50E.
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Alkynols and process for their preparation. 4,151,294, Cl. 424-283.000.
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Kushner, Cherie E.; Tews, Paul A.; and Nelson, Jerome W., to CRC-Crose, International, Inc. Method and apparatus for electric arc and analogous welding under precision control. 4,151,395, Cl. 219-125.120.

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Funada, Fumiaki; and Kuwagaki, Hiroshi, 4,151,326, Cl. 428-447.000.

Kwon, Young D.: *See—*
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,150,567, Cl. 73-146.000.

L. Schuler GmbH: *See—*
Schneider, Franz; and Braitinger, Helmut, 4,150,616, Cl. 100-35.000.

Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,151,300, Cl. 424-315.000.

Labrum, Joseph H., to Electro Controls Inc. Light-collecting reflector. 4,151,584, Cl. 362-302.000.

Ladygin, Jury V.: *See—*
Khokhulin, Vladimir N.; Ladygin, Jury V.; and Shver, Valery G., 4,150,511, Cl. 51-67.000.

Lafleur, Alonzo D.; Creehan, John T.; and Baugh, Robert E., to Ormet Corporation. Method of controlling the amount of seed material in the precipitation stage of the Bayer process. 4,150,952, Cl. 23-301.000.

Lafon, Louis, to Laboratoire L. Lafon. Acetohydroxamic acids. 4,151,300, Cl. 424-315.000.

LaFratta, Laurence A., to Rockwell International Corporation. Digital clock recovery circuit. 4,151,485, Cl. 331-1.00A.

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Lake Chemical Company: *See—*
Cooper, Robert N., 4,151,015, Cl. 148-23.000.

Lake, Marquis J., Sr.: *See—*
Acre, Leon R.; and Lake, Marquis J., Sr., 4,150,735, Cl. 188-196.0BA.

Lalk, Robert H.; and Evani, Syamalarao, to Dow Chemical Company, The. Novel polymers and polymeric salts. 4,151,341, Cl. 260-29.6RW.

Lam, Julia H. W.: *See—*
Crivello, James V.; and Lam, Julia H. W., 4,151,175, Cl. 260-326.260.

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Bachelard, Roland; Barral, Robert; Lamalle, Maurice; and Koeppel, Robert, 4,151,000, Cl. 106-109.000.

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Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,150,943, Cl. 8-41.00R.

Lamphere, Jack C.: *See—*
Volk, Henry; and Lamphere, Jack C., 4,151,140, Cl. 260-29.60H.

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Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and Nekljudova, administrator; by Olga V., 4,151,005, Cl. 136-89.0CC.

Lang, Gerard; and Bugaut, Andree, to L'Oreal. Diazomerocyanines and mesomeric forms thereof. 4,151,162, Cl. 260-158.000.

Lang, Walter; Jeanneret, Remy; and Kaiser, Anton, to Ciba-Geigy AG. Stable, concentrated dispersions of basic dyestuffs. 4,150,947, Cl. 8-93.000.

Lappage, Colin R. Wheeled carriage for recreational purposes. 4,150,838, Cl. 280-87.04A.

Larson, David F. Toothbrush. 4,150,457, Cl. 15-106.000.

Lash, Donald W. Double adhesive tape dispenser. 4,151,039, Cl. 156-584.000.

Latash, Yury V.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971. Cl. 75-10.00R.

Latorre, Alvaro. Apparatus for effecting and enhancing an erection. 4,150,669, Cl. 128-79.000.

Latrobe Steel Company: *See—*
Schlatter, Rene; and Hodder, Robert S., 4,150,978, Cl. 75-126.00C.
Simkovich, Ales; and Pugliese, Leonard A., 4,151,012, Cl. 148-11.50N.

Laub, Henry A., Jr.; and Laub, Steven D. Thread reforming tool with lockable rotary jaw structure. 4,150,450, Cl. 10-1.00B.

Laub, Steven D.: *See—*
Laub, Henry A., Jr.; and Laub, Steven D., 4,150,450, Cl. 10-1.00B.

Lawton, William R. Complex amine/silane treated cellulosic materials. 4,151,327, Cl. 428-447.000.

Laybourn, Robert J.; and Lynott, John J., to International Business Machines Corporation. Plural document stacking and subsequent selective stack transporting apparatus. 4,150,757, Cl. 414-107.000.

Layman, Ralph E.: *See—*
Blank, Werner J.; and Layman, Ralph E., 4,151,143, Cl. 260-29.6RW.

Lazzarotti, Sebastian J.; Bradshaw, Robert S.; and Hunter, James R., to Burroughs Corporation. Singulation device for mail. 4,150,743, Cl. 198-460.000.

Lee, Henry L., Jr.; Orlowski, Jan A.; and Kidd, Patrick D. Liquid paint-on dental restorative process and composition. 4,150,485, Cl. 32-15.000.

Lee, Irene W. H., to Fusion Incorporated. Single component brazing paste. 4,151,016, Cl. 148-24.000.

Lee, Soo-Il, to Owens-Illinois, Inc. Method of making a blown bottle with internal ribs. 4,151,249, Cl. 264-520.000.

Lee, Yoon C., to Monsanto Company. Fire retardant polymers of styrene and maleic anhydride. 4,151,218, Cl. 260-836.000.

Leech, George W.: *See—*
Mercer, John F., Sr., 4,150,550, Cl. 62-252.000.

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Ross, Charles W., 4,151,589, Cl. 364-106.000.

Leese, Leonard: *See—*
Geall, Charles L.; Leese, Leonard; Nicholas, Donald C.; Smith, Gordon C. R.; and Stokes, Geoffrey F., 4,151,159, Cl. 260-42.460.

Leesona Corporation: *See—*
Bradbury, Christopher G.; Buchan, Walter; Kropa, Gomer E.; and Winiarski, Edward J., 4,151,241, Cl. 264-142.000.
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Legille, Edouard; and Mahr, Rene, to S.A. des Anciens Etablissements Paul Wurth. Feed installation for apparatus for extracting hydrocarbons from bituminous schists. 4,151,047, Cl. 202-262.000.

Lehman, Jack E.: *See—*
Kemp, Klaus M.; and Lehman, Jack E., 4,150,548, Cl. 62-18.000.

Leibenzon, Semen A.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Cleaning of textile fiber tufts. 4,150,461, Cl. 19-200.000.

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Debat, Jacques; Lemoine, Jean; Guay, Bernard; and Crescioni, Claude, 4,151,278, Cl. 424-195.000.

Lenke, Gerd M.; Huntzinger, Elwood E.; and Holland, Dewey G., to Air Products and Chemicals, Inc. Cell regulators in structural foams. 4,151,333, Cl. 521-95.000.

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Hasler, Werner; Lennemann, Eckart; and Padmanabhan, Subramaniam, 4,150,619, Cl. 101-93.330.

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Lenz, Seymour S. Variable flexure test probe for microelectronic circuits. 4,151,465, Cl. 324-158.00P.

Lesgourgues, Jacques, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Method of joining metal parts. 4,150,776, Cl. 228-194.000.

Lespinasse, Pierre. Apparatus for excavation and earth removal from aquatic bottoms. 4,150,503, Cl. 37-71.000.

Lester, Dudley R.; and Reeves, Leslie D., to Vianini Pipes (Proprietary) Limited. Manufacture of short pipes. 4,151,246, Cl. 264-297.000.

Leugering, Hans J.: *See—*
Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Leugering, Hans J.; and Heller, Alwin, 4,151,346, Cl. 528-230.000.

Leven, Peter: *See—*
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Lever Brothers Company: *See—*
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Nelson, Robert T., 4,151,097, Cl. 252-8.600.

Levine, Eli: *See—*
Neuschwanter, Chris F.; and Levine, Eli, 4,151,147, Cl. 260-29.60T.

Levinstein, Hyman J.; and Sinha, Ashok K., to Bell Telephone Laboratories, Incorporated. Hydrogen annealing process for stabilizing metal-oxide-semiconductor structures. 4,151,007, Cl. 148-1.500.

Levy, Lloyd E., to Ingersoll-Rand Company. Variable rate test joint. 4,150,559, Cl. 73-1.00C.

Lewandowski, Ted J., to Northern Telecom Limited. Negative impedance converters. 4,151,493, Cl. 333-216.000.

Lewis, Brian: *See—*
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,151,297, Cl. 424-304.000.

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Friedman, Ronald L.; and Lewis, Roger N., 4,151,339, Cl. 526-204.000.

Lewis, William E.: *See—*
Allan, David E.; and Lewis, William E., 4,151,070, Cl. 208-59.000.

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Polinsky, Murray A.; and Lewis, William N., 4,151,538, Cl. 357-23.000.

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Droste, Werner; and Adler, Walter, 4,150,911, Cl. 405-177.000.

Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Flavoring with substituted norbornane derivatives. 4,151,309, Cl. 426-538.000.

Ligones, Hubert, to Battelle Memorial Institute. Thread tying device for spinning frame. 4,150,532, Cl. 57-263.000.

Lill, Melvin H.: *See—*
Roberts, Thomas E., Jr.; Wiederrich, James L.; Lill, Melvin H.; and Chang, Andrew K., 4,150,897, Cl. 356-152.000.

Lilly Industries Limited: *See—*
Dawson, William; Foulis, Michael J.; Gutteridge, Norman J. A.; and Smith, Colin W., 4,151,199, Cl. 562-504.000.

Lindner, Christian; Korte, Siegfried; El Sayed, Aziz; and Suling, Carlhans, to Bayer Aktiengesellschaft. Acrylonitrile polymer blended with a statistical copolymer of acrylic acid alkyl ester and styrene. 4,151,228, Cl. 260-898.000.

Lindquist, Julius A., to Johnson & Johnson. Reversible thermometer. 4,150,572, Cl. 73-356.000.

Link, Donald F., to Recovery Systems, Inc. Waste food processor. 4,150,795, Cl. 241-33.000.

Lipke, Donald L., to Varo, Inc. Active imaging system using variable gate width time programmed dwell. 4,151,415, Cl. 250-333.000.
Liquid Terminals, Inc.: *See*—
Schofield, James W., 4,151,234, Cl. 264-13.000.
Litovchenko, Sergei S.; and Alyapkin, Vladimir D. Method for reading information from punched carrier and device for effecting same. 4,150,783, Cl. 235-458.000.
Litsenko, Tatyana A.: *See*—
Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and Nekljudova, administrator; by Olga V., 4,151,005, Cl. 136-89.0CC.
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Hakkenberg, Peter; and Livesay, Richard E., 4,150,856, Cl. 305-11.000.
Lloyd, Samuel H., III; and Goren, Yoram, to Santa Fe International Corporation. Twin hull semi-submersible derrick barge. 4,150,635, Cl. 114-61.000.
Loebel, Wolf; and Rutsch, Robert, to Motoren- und Turbinen-Union Munchen GmbH. Torque measuring device for gas turbine engines, especially turbo jet engines. 4,150,566, Cl. 73-136.00A.
Loffler, Reinhard; and Possler, Harald, to Werner & Pfleiderer. Subwater granulating device. 4,150,595, Cl. 83-171.000.
Logic Devices, Inc.: *See*—
Allen, Paul E., 4,151,243, Cl. 264-219.000.
Lohmann, Gert: *See*—
Dischler, Helmut; Huydts, Eduard; and Lohmann, Gert, 4,150,739, Cl. 192-107.00R.
Lohmeyer, Kurt W., to Tru-Spoke, Inc. Wire wheel sealing system. 4,150,854, Cl. 301-58.000.
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Aucktor, Erich, 4,150,553, Cl. 64-22.000.
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Hofmann, William E.; and Long, Alton W., 4,150,964, Cl. 65-181.000.
Longsworth, Ralph C., to Air Products and Chemicals, Inc. Cryopumping method and apparatus. 4,150,549, Cl. 62-55.500.
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Kalopissis, Gregoire, 4,151,301, Cl. 424-316.000.
Lang, Gerard; and Bugaut, Andree, 4,151,162, Cl. 260-158.000.
Lorenz, Hans-Peter: *See*—
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, 4,150,877, Cl. 350-341.000.
Losee, Paul D.; and Robinson, Neil L., to International Business Machines Corporation. Method of making magnetic head cores with cant angles. 4,150,479, Cl. 29-603.000.
Losinger AG: *See*—
Dietrich, Hans, 4,150,473, Cl. 29-461.000.
Lubrizol Corporation, The: *See*—
Vogel, Paul W., 4,151,173, Cl. 260-326.50F.
Lucas, Malcolm B.; and Van Coney, Robert H., to Procter & Gamble Company, The. Method for debossing and perforating a running ribbon of thermoplastic film. 4,151,240, Cl. 264-504.000.
Ludloff, Wolfgang H. E. Electronic flash apparatus. 4,151,446, Cl. 315-241.00R.
Lund, Albert H.: *See*—
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,151,305, Cl. 426-131.000.
Lundh, Roy W., to Roy Walfrid Poseidon Marketing & Development Co. Deep water berthing system for very large cargo carriers. 4,150,636, Cl. 114-230.000.
Lurssen, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, to Bayer Aktiengesellschaft. Agents for regulating plant growth. 4,150,967, Cl. 71-92.000.
Luthi, Christian: *See*—
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Gasser, Hermann; and Curiger, Karl, 4,150,533, Cl. 57-265.000.
Lynch, Gary J.: *See*—
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Lynenwerk GmbH & Co. KG: *See*—
Ney, Robert, 4,151,237, Cl. 264-40.700.
Lynott, John J.: *See*—
Laybourn, Robert J.; and Lynott, John J., 4,150,757, Cl. 414-107.000.
Maake, Douglas H., to Gould Inc. Clothes dryer heating unit. 4,151,398, Cl. 219-374.000.
MacGregor, Paul T.: *See*—
Karger, Eva R.; and MacGregor, Paul T., 4,151,174, Cl. 260-326.13R.
Machida, Takayasu: *See*—
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, 4,150,536, Cl. 58-23.00D.
MacKay, Patrick W.: *See*—
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Maddox, Lodric L.: *See*—
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Maeda, Takamichi: *See*—
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Maertins, Horst; Rothfuss, Peter; Maier, Gernot; and Stratemeier, Ulrich, to Robert Bosch GmbH. Graphic input controlled automatic positioning system. 4,151,451, Cl. 318-568.000.
Maffei, Carlos E. M., to Promon Engenharia SA. Construction of underground galleries. 4,150,910, Cl. 405-149.000.
Magnetfabrik Bonn, GmbH vormals Gewerkschaft Windhorst: *See*—
Steingroever, Erich A., 4,150,927, Cl. 425-3.000.
Magoriea, Vincent G., to Systron-Donner Corporation. Fluid sampler and minimum-included-air-coupling. 4,150,575, Cl. 73-422.00R.
Mahle, Christoph E.: *See*—
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Mahr, Rene: *See*—
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Maertins, Horst; Rothfuss, Peter; Maier, Gernot; and Stratemeier, Ulrich, 4,151,451, Cl. 318-568.000.
Maldavs, Ojars, to Gould Inc. Quick disconnect coupling. 4,150,691, Cl. 137-614.030.
Malerba, Mario; and Galeotti, Massimo, to Indesit Industria Elettrodomestici Italiana S.p.A. Line output transformer. 4,151,500, Cl. 336-185.000.
Malik, Lionel W. Water purification system. 4,151,085, Cl. 210-101.000.
Maltese, Paolo: *See*—
Barzilai, Giorgio; Maltese, Paolo; and Ottavi, Cesare M., 4,150,878, Cl. 350-344.000.
Manini, Silvio: *See*—
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Mann, Friedrich: *See*—
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Mann, John: *See*—
Orr, Thomas S. C.; Hall, David E.; and Mann, John, 4,151,292, Cl. 424-273.00P.
Manners, David E., to GTE Sylvania Incorporated. Power supply discharge circuit for TV receiver. 4,151,558, Cl. 358-190.000.
Manso, Hipolito. Book holding device. 4,150,807, Cl. 248-452.000.
Manufacturers Brush Company, The: *See*—
Samuelson, Ivar J., 4,150,955, Cl. 51-298.000.
Manzoni, Stephane N., to Societe Manzoni-Bouchot. Control device for a rearview mirror. 4,150,585, Cl. 74-501.00M.
Mapes, Leland O. Automatic mailbox signal. 4,150,780, Cl. 232-35.000.
Marchand, Joseph; and Roger, Andre, to Commissariat a l'Energie Atomique. Device for the analysis of samples by measurement of the heat flux released at the time of contacting of each sample with a reagent. 4,151,252, Cl. 422-51.000.
Marchese, Anthony. Checkerboard game. 4,150,828, Cl. 273-260.000.
Marcilly, Christian, to Institut Francais du Petrole. Preparation process of a catalyst for converting aromatic hydrocarbons. 4,151,120, Cl. 252-455.00Z.
Mardesich, Nicholas A.: *See*—
Burger, Norman D., 4,150,522, Cl. 53-470.000.
Markowitz, Alan E., to United States of America, Navy. Termination for a reinforced plastic hose. 4,150,862, Cl. 339-15.000.
Marshall, David: *See*—
Dyson, Allen F.; and Marshall, David, 4,151,144, Cl. 260-29.6WB.
Marshall, Jeffrey D., to Mobil Oil Corporation. Laminar thermoplastic film constructions. 4,151,318, Cl. 428-35.000.
Marti, Milford F. Wheel brake assembly. 4,150,736, Cl. 188-332.000.
Martin, John K., III: *See*—
Whitney, Douglass G.; and Martin, John K., III, 4,150,672, Cl. 128-214.00F.
Martinez-Vera, Enrique R.: *See*—
Price-Falcon, Juan F.; MacKay, Patrick W.; Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, 4,150,972, Cl. 75-35.000.
Maruoka, Hiroyuki: *See*—
Masaki, Kenji; and Maruoka, Hiroyuki, 4,150,644, Cl. 123-119.00E.
Maruzen Oil Co., Ltd.: *See*—
Watanabe, Yoshihide; Kitada, Keiji; Kuratani, Osamu; and Iriuchijima, Makoto, 4,151,220, Cl. 260-850.000.
Marvin Glass & Associates: *See*—
Tucker, James E.; and Meyer, Burton C., 4,150,839, Cl. 280-771.000.
Marwin (Holdings) Limited: *See*—
Beale, David W. B., 4,151,399, Cl. 219-385.000.
Marzoli, Angelo, to Upjohn Company, The. Spinning and twisting mechanism. 4,150,531, Cl. 57-124.000.
Masaki, Kenji; and Maruoka, Hiroyuki, to Nissan Motor Company, Limited. Method for controlling electrostatic fuel injectors. 4,150,644, Cl. 123-119.00E.
Masaki, Kenji: *See*—
Suzuki, Suzuo; Masaki, Kenji; and Nagaishi, Hatuo, 4,150,647, Cl. 123-119.00E.
Mascherpa, Carlo. Apparatus for stowing and conveying articles, particularly for use in parking motor vehicles. 4,150,758, Cl. 414-282.000.
Maschinenfabric Augsburg-Nurnberg Aktiengesellschaft: *See*—
Helm, Siegfried; and Leven, Peter, 4,151,017, Cl. 148-126.000.
Mashio, Tasuku: *See*—
Ogawa, Toshio; Nishiyama, Hiroshi; and Mashio, Tasuku, 4,151,324, Cl. 428-432.000.
Masliah, Leon; and Morand, Jean F., to Electronique Marcel Dassault. Process and apparatus for the detection of objects, especially of objects having a very small equivalent surface area. 4,151,527, Cl. 343-7.500.
Massey-Ferguson Inc.: *See*—
Mueller, Otto, Jr., 4,150,586, Cl. 74-532.000.

Masui, Takatoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Arrangement for controlling an air-fuel ratio of an air-fuel mixture of an internal combustion engine. 4,150,641, Cl. 123-119.0EC.

Maternaghan, Trevor J., to Ciba-Geigy AG. Process for the manufacture of photographic silver halide emulsions containing silver halide crystals of the twinned type. 4,150,994, Cl. 96-94.00R.

Mathews, Carl F.: *See*—
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,151,224, Cl. 260-876.00R.

Mathias Bauerle GmbH: *See*—
Raible, Hermann, 4,150,621, Cl. 101-207.000.

Matsuda, Yasumasa: *See*—
Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, 4,151,502, Cl. 338-2.000.

Matsumoto, Yoshihisa; Yonekubo, Hiroaki; and Hatsutori, Shoji, to Matsushita Electric Industrial Co., Ltd. Remote-controlled central air-conditioning system. 4,150,788, Cl. 237-8.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Matsumoto, Yoshihisa; Yonekubo, Hiroaki; and Hatsutori, Shoji, 4,150,788, Cl. 237-8.00R.
Suzuki, Takashi, 4,151,245, Cl. 264-288.000.

Matsuura, Susumu: *See*—
Koga, Yoshio; Sumita, Tsuneyo; Inoue, Nobuo; and Matsuura, Susumu, 4,151,442, Cl. 313-467.000.

Mattel, Inc.: *See*—
Bailey, Charles E.; Bass, Sidney; and Edmisson, Russell C., 4,150,903, Cl. 400-95.000.

Matthews, Francis T., to Combustion Engineering, Inc. Char separator. 4,150,632, Cl. 110-342.000.

Matthies, Hans G.: *See*—
Neuberg, Rainer; Penzien, Klaus; and Matthies, Hans G., 4,151,223, Cl. 260-873.000.

Mattil, Karl F.; Rhee, Khee C.; and Cater, Carl M., deceased (by Cater, Betty J., administratrix), to Andersons, The. Soybean protein extract. 4,151,310, Cl. 426-656.000.

Matucheski, Joseph V., to Wallace Murray Corporation. Radiator cooling fan construction. 4,150,919, Cl. 416-93.00R.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Meier, Gerd E. A.; and Hiller, Winfried, 4,150,696, Cl. 138-44.000.

Maxwell, Jerrold F.: *See*—
Nassry, Assadullah; and Maxwell, Jerrold F., 4,151,099, Cl. 252-32.70E.

May, Geoffrey J.; and Tan, Stephen R., to Chloride Silent Power Limited. Production of beta-alumina. 4,151,235, Cl. 264-13.000.

Maynard, Walter P., Jr. Container opening and pouring attachment. 4,150,768, Cl. 222-89.000.

Mayne, William H.; Badger, Algernon S.; and Hawes, William S., deceased (by Hawes, Louise A. M., administrator), to Geosource Inc. Bidirectional seismic array and method of seismic exploration. 4,151,504, Cl. 340-15.5MC.

Mazelsky, Bernard, to ARA, Inc. Crash survivable seat. 4,150,805, Cl. 244-122.00R.

Mazurek, Stanley L., to Continental Group, Inc., The. Tab construction for easy opening container. 4,150,765, Cl. 220-269.000.

Mazzola, Mario, to Ing. C. Olivetti & C., S.p.A. Discrimination during reading of data prerecorded in different codes. 4,151,565, Cl. 360-40.000.

MBI, Inc.: *See*—
Schiffman, Murray M., 4,151,040, Cl. 156-659.000.

McBride, Lyle E.; Delagi, Richard G.; and Trenkler, George, to Texas Instruments Incorporated. Low-power, infrared information transmission system. 4,151,407, Cl. 250-199.000.

McCann, Elrey L., III, to Du Pont de Nemours, E. I., and Company. Catalytic perovskites on perovskite supports and process for preparing them. 4,151,123, Cl. 252-462.000.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Polymer dispersion process. 4,151,133, Cl. 260-23.00H.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Process for simultaneously dispersing and saponifying ethylene-vinyl acetate copolymer. 4,151,134, Cl. 260-23.00H.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Processes for producing dry powders from tacky polymers via dispersion of same in water with dispersants convertible to parting agents. 4,151,135, Cl. 260-23.00R.

McClean, John W., to Breville Holdings Pty. Ltd. Cooking apparatus. 4,150,609, Cl. 99-372.000.

McCollum, John D.; and Quick, Leonard M., to Standard Oil Company (Indiana). Process for recovering and upgrading hydrocarbons from oil shale. 4,151,068, Cl. 208-11.0LE.

McCord Corporation: *See*—
Melnyk, William, 4,150,556, Cl. 72-333.000.

McCoy, Charles M. Method of strip mining. 4,150,852, Cl. 299-18.000.

McCoy, Charles M. Method of strip mining. 4,150,853, Cl. 299-18.000.

McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. Reduction and reoxidation of cogel or self-reduced catalyst. 4,151,122, Cl. 252-458.000.

McDermott, Joseph X., to Halcon Research and Development Corporation. Preparation of maleic anhydride. 4,151,116, Cl. 252-435.000.

McDonnell Douglas Corporation: *See*—
Walker, James V., 4,150,836, Cl. 277-188.00A.

McElroy, David J., to Texas Instruments Incorporated. High density N-channel silicon gate read only memory. 4,151,020, Cl. 148-187.000.

McElroy, David J., to Texas Instruments Incorporated. Method of making a high density floating gate electrically programmable ROM. 4,151,021, Cl. 148-187.000.

McGinnis, Charles P. Fishing rod holder. 4,150,506, Cl. 43-21.200.

McInerney, Frank T., to MLS-Worthington Limited. Railway truck span bolster. 4,150,626, Cl. 105-199.00F.

McKenna, Charles M.: *See*—
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,151,420, Cl. 250-492.00A.

McLay, William J.: *See*—
Aronoff, Edward I.; and McLay, William J., 4,150,948, Cl. 8-151.000.

McMillan, Andrew H.; and Templeton, William B., to Burroughs Corporation. Document processing, jam detecting apparatus and process. 4,151,410, Cl. 250-223.00R.

McNeilly, Michael A., to Smith, Robert E. Anti-fogging sports goggle. 4,150,443, Cl. 2-436.000.

McRae, Daniel D., to Harris Corporation. Technique for supplying reference for an adaptive equalizer when multiple phase signals are transmitted. 4,151,491, Cl. 333-18.000.

MDH Industries, Inc.: *See*—
Harrington, Timothy M.; and Harrington, Steven M., 4,151,404, Cl. 235-92.0GA.

Mead Corporation, The: *See*—
Burnett, James E., 4,151,555, Cl. 358-75.000.

Meadows, John W.; and Ritter, Robert J., to Quantor Corporation. High speed, low temperature and pressure diazo processing method. 4,150,992, Cl. 96-49.000.

Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., to Institut Elektrosvarki IM.E.O. Patona. Start-up method for an electroslag remelting system. 4,150,971, Cl. 75-10.00R.

Medtronic, Inc.: *See*—
Menken, John D.; Brastad, Brian A.; and Barthel, Thomas C., 4,151,513, Cl. 340-206.000.

Meenen, Guenter, to Akzona Incorporated. Process for the preparation of uniform, stable diacyl peroxide composition. 4,151,106, Cl. 252-186.000.

Megapulse, Incorporated: *See*—
Johannessen, Paul R., 4,151,528, Cl. 343-103.000.

Meier, Gerd E. A.; and Hiller, Winfried, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Arrangement for suppressing vibrations caused by the flow of a flowable medium. 4,150,696, Cl. 138-44.000.

Meiers, Gerald F., to Deere & Company. Machine for forming cylindrical hay bales. 4,150,527, Cl. 56-341.000.

Meiji Seika Kaisha, Ltd.: *See*—
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, 4,151,041, Cl. 195-31.00P.

Melnyk, William, to McCord Corporation. Radiator tank headsheet and method. 4,150,556, Cl. 72-333.000.

Mena, Amado. Jack system for vehicle. 4,150,813, Cl. 254-86.00H.

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Menzel, Helmut: *See*—
Neuser, Johannes; and Menzel, Helmut, 4,151,385, Cl. 200-153.0LA.

Menzl, Kurt; and Franzmair, Rudolf, to Chemie Linz Aktiengesellschaft. Process for preparing 3-methoxy-4-(4'-aminobenzenesulfonamido)-1,2,5-thiadiazole. 4,151,164, Cl. 260-239.950.

Mercer, John F., Sr., to Leech, George W. Self defrosting refrigerated display case. 4,150,550, Cl. 62-252.000.

Merchant, Stanley R.: *See*—
Cermak, Michael J.; and Merchant, Stanley R., 4,151,503, Cl. 338-14.000.

Merck & Co., Inc.: *See*—
Baldwin, John J., 4,151,284, Cl. 424-263.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,151,302, Cl. 424-317.000.
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, 4,151,294, Cl. 424-283.000.

Merkel, Stephen L.; Small, Charles B.; and Norton, Barton F., to Airborne Mfg. Co. Motion picture projector system. 4,150,886, Cl. 352-166.000.

Merrell, Richard G., to Zenith Radio Corporation. Electronic television tuner interface circuit. 4,151,559, Cl. 358-192.000.

Merrick Scale Mfg. Company: *See*—
Rebucci, Eugene L., 4,150,701, Cl. 141-232.000.

Merz, Walter, to Bayer Aktiengesellschaft. Process for the preparation of 6-tert.-butyl-3-mercapto-4-amino-1,2,4-triazin-5(4H)-one. 4,151,355, Cl. 544-182.000.

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Auer, Rupert, 4,150,772, Cl. 226-90.000.

Metraplan Spaa - Societe Anonyme: *See*—
Fayolle, Aime; and Rignon, Michel, 4,151,459, Cl. 324-52.000.

Metzger, Gerhard, to Transfertex Thermodruck-system GmbH. Printed textile web material and method. 4,151,033, Cl. 156-235.000.

Meyer, Alfred: *See*—
Drabek, Jozef; and Meyer, Alfred, 4,151,298, Cl. 424-304.000.

Meyer, Armin; Muller, Jorg; Brandli, Bruno; and Wahli, Robert, to Gretag Aktiengesellschaft. Exposure control system for color printers. 4,150,894, Cl. 355-38.000.

Meyer, Burton C.: *See*—
Tucker, James E.; and Meyer, Burton C., 4,150,839, Cl. 280-771.000.
Meyer, Guenter: *See*—
Dehnert, Johannes; Lamm, Gunther; Juenemann, Werner; and Meyer, Guenter, 4,150,943, Cl. 8-41.00R.
Meyer, Victor E.: *See*—
Peters, James; and Meyer, Victor E., 4,151,150, Cl. 260-29.70R.
Michigan State University, Board of Trustees of: *See*—
Ries, Stanley K.; and Sweeley, Charles C., 4,150,970, Cl. 71-122.000.
Mid-America Sweeteners, Inc.: *See*—
Fox, Kenneth L., Jr., 4,150,700, Cl. 141-11.000.
Midland-Ross Corporation: *See*—
Acre, Leon R.; and Lake, Marquis J., Sr., 4,150,735, Cl. 188-196.0BA.
Mihashi, Yutaka; Nakata, Josuke; Sogo, Toshio; and Yamanaka, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Process of producing semiconductor thermally sensitive switching element by selective implantation of inert ions in thyristor structure. 4,151,011, Cl. 148-1.500.
Miki, Kiyoshi: *See*—
Hinachi, Matatoyo; and Miki, Kiyoshi, 4,151,526, Cl. 343-7.0VM.
Milburn, Zachariah H., Jr.: *See*—
Funston, David L.; and Milburn, Zachariah H., Jr., 4,151,481, Cl. 330-279.000.
Miller, Curtis G. Mattress construction. 4,150,447, Cl. 5-371.000.
Miller, Edward G.: *See*—
Capuano, Italo A.; and Miller, Edward G., 4,151,255, Cl. 422-76.000.
Miller, Jack V. Flashlight. 4,151,583, Cl. 362-205.000.
Miller, Robert G.: *See*—
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; Miller, Robert G.; and Caterpillar Tractor Co., 4,150,654, Cl. 123-179.00L.
Min, Manki. Finger-toe nail clipper having shifting receptacle. 4,150,481, Cl. 30-28.000.
Minarik, Milan; Popl, Milan; and Mostecky, Jiri, to Vysoka skola chemicko-technologicka. Method of and apparatus for the recirculation of fluids in a closed circuit. 4,150,563, Cl. 73-61.10C.
Minnesota Mining and Manufacturing Company: *See*—
Druker, Leonard J.; and Kincaid, Robert B., 4,150,996, Cl. 106-2.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Horoshi; Kawamura, Kunio; and Yamazaki, Keiji, 4,150,889, Cl. 354-37.000.
Mio, Mitushi, to Awaji Sangyo Kabushikikaishi. Flexible pattern to be used for casting molds. 4,150,713, Cl. 164-237.000.
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, to Sankyo Company Limited. Polyprenyl piperazines. 4,151,357, Cl. 544-386.000.
Misomex Aktiebolag: *See*—
Dillow, Brian St. P., 4,150,991, Cl. 96-41.000.
Misumi, Teruyuki: *See*—
Shiga, Masaaki; Misumi, Teruyuki; and Tanaka, Takashi, 4,151,165, Cl. 546-257.000.
Mitchell, Kenneth A. W.: *See*—
Donaghue, Paul F.; and Mitchell, Kenneth A. W., 4,151,022, Cl. 149-19.400.
Mitsubishi Aluminum Kabushiki Kaisha: *See*—
Imaizumi, Shigetake; Yamada, Kazuo; and Katsumata, Katashi, 4,150,980, Cl. 75-146.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Kanoh, Natsuki; Tanaka, Toru; and Enokido, Nobuo, 4,151,337, Cl. 526-116.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Mihashi, Yutaka; Nakata, Josuke; Sogo, Toshio; and Yamanaka, Kenichi, 4,151,011, Cl. 148-1.500.
Suzuki, Shigehiko; and Imaiida, Satoshi, 4,151,453, Cl. 318-762.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Tsuchiya, Hideshi; Takamatsu, Tetsuo; Furushima, Masakazu; and Hojo, Shiro, 4,150,966, Cl. 71-78.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Amano, Kazutoshi; Suehiro, Kazuyasu; Sato, Takehiko; and Ohnishi, Yuuji, 4,151,217, Cl. 260-683.00R.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,151,432, Cl. 310-26.000.
Mitsubishi Petrochemical Company Limited: *See*—
Amano, Kazutoshi; Suehiro, Kazuyasu; Sato, Takehiko; and Ohnishi, Yuuji, 4,151,217, Cl. 260-683.00R.
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, 4,151,111, Cl. 252-429.00B.
Mitsuku Denki Kogyo K.K.: *See*—
Miyata, Muneyoshi, 4,151,383, Cl. 200-67.00D.
Miura, Yuji: *See*—
Fukuhara, Takeshi; and Miura, Yuji, 4,151,374, Cl. 179-18.0GF.
Miyake, Haruhisa: *See*—
Ichimura, Masahiko; Miyake, Haruhisa; Kodama, Shun-ichi; and Hisasue, Michio, 4,151,340, Cl. 526-249.000.
Miyake, Hiroshi; Tenma, Satoru; Sato, Nobuyoshi; and Honda, Akira, to Toyo Soda Manufacturing Co., Ltd. Process for producing metallic chromium. 4,150,975, Cl. 75-101.00R.
Miyata, Muneyoshi, to Mitsuku Denki Kogyo K.K. Leaf-spring switch. 4,151,383, Cl. 200-67.00D.
Miyauchi, Hirotsugu: *See*—
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.
MLS-Worthington Limited: *See*—
McInerney, Frank T., 4,150,626, Cl. 105-199.00F.
Mobay Chemical Corporation: *See*—
Young, James W.; and Synek, Joseph, 4,150,968, Cl. 71-93.000.
Mobil Oil Corporation: *See*—
Ackerman, Alfred J.; and Carrock, Frederick E., 4,151,128, Cl. 260-17.00A.
Braid, Milton, 4,151,100, Cl. 252-42.700.
Davis, Kenneth G.; Due, George B.; and Lund, Albert H., 4,151,305, Cl. 426-131.000.
Haynes, Ben R., 4,151,514, Cl. 340-286.00R.
Marshall, Jeffrey D., 4,151,318, Cl. 428-35.000.
Pedersen, August B., 4,151,256, Cl. 422-102.000.
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., 4,151,189, Cl. 260-448.00C.
Yan, Tsoung-Yuan; and Esrenscheid, Wilton F., 4,151,066, Cl. 208-8.0LE.
Mochizuki, Yoshifumi; and Yoshida, Makoto, to Citizen Watch Company Limited. Electronic timepiece and method for testing operation of the same. 4,150,537, Cl. 58-23.00R.
Moghe, Sharad R., to B. F. Goodrich Company, The. Extruder strainer plate. 4,150,932, Cl. 425-197.000.
Mohon, Windell N.: *See*—
Derderian, George; and Mohon, Windell N., 4,151,411, Cl. 250-225.000.
Mohri, Takuo, to Akae Kikai Kogyo Co. Ltd. Wet-type sand classifier. 4,151,074, Cl. 209-44.000.
Moldovan, Daniel: *See*—
Emig, Gale L.; and Moldovan, Daniel, 4,151,145, Cl. 260-29.60S.
Molex Incorporated: *See*—
Krafthefer, Kerry M.; and Stipanuk, John M., 4,150,863, Cl. 339-17.0LC.
Molins Machine Company, Inc.: *See*—
Woolston, Allan B., 4,151,403, Cl. 235-92.0DN.
Mommeja, Patrick F.: *See*—
Laignel, Raymond A.; and Mommeja, Patrick F., 4,150,810, Cl. 251-309.000.
Monolithic Memories, Inc.: *See*—
Moss, William E., 4,151,609, Cl. 365-221.000.
Monsanto Company: *See*—
Dyroff, David R.; Suchanek, Walton F., Jr.; and Schiff, Thomas G., 4,151,271, Cl. 424-48.000.
Gutsche, Henry W.; Dever, Thomas L.; and Hepperman, John T., 4,150,912, Cl. 407-31.000.
Kidwell, Roger L.; and Lynch, Gary J., 4,151,186, Cl. 269-429.300.
Lee, Yoon C., 4,151,218, Cl. 260-836.000.
Singleton, Thomas C., 4,151,107, Cl. 252-373.000.
Yung, Kai-Lim W., 4,150,674, Cl. 428-288.000.
Montanino, Patrick J.: *See*—
Rhoades, John M.; and Montanino, Patrick J., 4,151,547, Cl. 357-81.000.
Montedison S.p.A.: *See*—
Casnati, Giuseppe; Casiraghi, Giovanni; Puglia, Giuseppe; Sartori, Giovanni; and Terenghi, Giuliana, 4,151,201, Cl. 260-562.00A.
Montgomery Elevator Company: *See*—
Holuba, Henry J., 4,151,381, Cl. 200-61.390.
Mookherjee, Braja D.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,151,181, Cl. 260-345.80R.
Moore, David M.: *See*—
Ream, Ronald L.; and Moore, David M., 4,151,270, Cl. 424-48.000.
Stahl, Charles J.; Armstrong, Bruce L.; and Moore, David M., 4,150,753, Cl. 211-105.100.
Moore, Eugene R.; Christianson, Thomas K.; and Wence, Ronald L., to Dow Chemical Company, The. Process for continuously removing volatile organic material from aqueous dispersions of synthetic polymers. 4,151,141, Cl. 260-29.60R.
Moore, Michael T.: *See*—
Anderson, Howard W.; and Moore, Michael T., 4,150,987, Cl. 96-1.50R.
Moorman, Charles J.; and Kistner, Jerome L., to Mosler Safe Company, The. Card reader with selectively movable baffle to controllably restrict card insertion. 4,150,784, Cl. 235-479.000.
Morand, Jean F.: *See*—
Masliah, Leon; and Morand, Jean F., 4,151,527, Cl. 343-7.500.
More, Anton; Riedle, Rudolf; Straussberger, Herbert; Streckel, Willi; and Muschi, Johann, to Wacker-Chemie GmbH. Process of melting down and purifying silicon. 4,151,264, Cl. 423-348.000.
More Corporation: *See*—
Hayashi, Yoshitsugu, 4,150,501, Cl. 37-43.00B.
Morel, Roger. Coating objects by electrostatic spraying. 4,151,428, Cl. 307-328.000.
Morelock, Charles R., to General Electric Company. Rotary sealant abradable material and method for making. 4,150,998, Cl. 106-44.000.
Mori, Sanae, to Daido Metal Company Ltd. Tin base white metal bearing alloys. 4,150,983, Cl. 75-175.00A.

Morinaga, Takashi; Okano, Yasuyuki; Kakefuda, Koichi; and Suzue, Kiyoyuki, to Hitachi Chemical Company, Ltd. Process for producing thermoplastic resin highly resistant to impact and weather. 4,151,226, Cl. 260-881.000.
Morishita, Hirosada: *See*—
Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, 4,151,313, Cl. 427-98.000.
Moritsu, Yukikazu; Yamada, Kooji; Wada, Masatoshi; and Munemoto, Eiji, to Okuno Chemical Industry Co., Ltd. Vitreous enamel composition containing palladium powder. 4,150,995, Cl. 106-1.210.
Morokawa, Shigeru; Sekiya, Fukuo; and Hashimoto, Yukio, to Citizen Watch Company Limited. Electronic timepiece. 4,150,535, Cl. 58-23.00R.
Morris, Marvin E.; Pierce, Jim D.; and Whitfield, Willis J., to United States of America, Energy. Solids irradiator. 4,151,419, Cl. 250-453.000.
Morrison Textile Machinery Co.: *See*—
Talbert, James E., 4,150,449, Cl. 8-151.000.
Morton-Norwich Products, Inc.: *See*—
White, Ralph L., Jr., 4,151,248, Cl. 260-307.00R.
Mosier, Jacques: *See*—
Boyer, Curtis E.; and Mosier, Jacques, 4,151,466, Cl. 324-166.000.
Mosler Safe Company, The: *See*—
Moorman, Charles J.; and Kistner, Jerome L., 4,150,784, Cl. 235-479.000.
Mosley, William H., Jr.: *See*—
Heinrich, Eric C.; and Mosley, William H., Jr., 4,151,478, Cl. 330-108.000.
Moss, Richard L. Vehicle light bulb with extending electrical wires. 4,151,439, Cl. 313-318.000.
Moss, William E., to Monolithic Memories, Inc. First in first out (FIFO) memory. 4,151,609, Cl. 365-221.000.
Mostecky, Jiri: *See*—
Minarik, Milan; Popl, Milan; and Mostecky, Jiri, 4,150,563, Cl. 73-61.10C.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
Loebel, Wolf; and Rutsch, Robert, 4,150,566, Cl. 73-136.00A.
Motorola, Inc.: *See*—
Kelley, Stephen H., 4,151,517, Cl. 340-347.00C.
Nicolini, John D.; and Willard, David F., 4,151,367, Cl. 178-69.100.
Riff, James A., 4,151,544, Cl. 357-65.000.
Mott, Philip G. Strap tool. 4,150,592, Cl. 81-64.000.
Mueller, David C., to American Can Company. Tamperproof reclosable carton. 4,150,748, Cl. 206-624.000.
Mueller, Herman W.: *See*—
Yueh, Mao H.; Daravingas, George V.; Rigelhof, Fred J.; and Mueller, Herman W., 4,151,307, Cl. 426-549.000.
Mueller, Otto, Jr., to Massey-Ferguson Inc. Control mechanism. 4,150,586, Cl. 74-532.000.
Muhs, Reinhard: *See*—
Stollenwerk, Joseph A.; and Muhs, Reinhard, 4,150,622, Cl. 101-378.000.
Mukai, Yoshihumi: *See*—
Ikegami, Yoshio; Mukai, Yoshihumi; Satoh, Hidehumi; and Kondo, Koichi, 4,150,801, Cl. 242-158.00R.
Muller, Friedhelm: *See*—
Sackmann, Gunter; Kolb, Gunter; Fischer, Heinz; and Muller, Friedhelm, 4,151,336, Cl. 526-15.000.
Muller, Gunter, to Badische Maschinenfabrik G.m.b.H. Method and apparatus for manual preparation work on foundry molding boxes at a single-station throughflow molding machine. 4,150,705, Cl. 164-18.000.
Muller, Helmut, to Kiefer, Siegfried, a part interest. Valve device for draining liquids. 4,150,809, Cl. 251-149.400.
Muller, Jorg: *See*—
Meyer, Armin; Muller, Jorg; Brandli, Bruno; and Wahli, Robert, 4,150,894, Cl. 355-38.000.
Muller, Wolfgang; and Witzke, Lothar, to Th. Goldschmidt AG. Processing nonferrous metal hydroxide sludge wastes. 4,151,257, Cl. 423-24.000.
Munemoto, Eiji: *See*—
Moritsu, Yukikazu; Yamada, Kooji; Wada, Masatoshi; and Munemoto, Eiji, 4,150,995, Cl. 106-1.210.
Muntadas, Manuel B.: *See*—
Nogueira, Eduardo D.; Abad, Angel L. R.; Muntadas, Manuel B.; and Vega, Jose M. R., 4,151,077, Cl. 210-21.000.
Murakami, Hajime: *See*—
Takahata, Kei; and Murakami, Hajime, 4,150,986, Cl. 96-1.50R.
Murakami, Kanji: *See*—
Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, 4,151,313, Cl. 427-98.000.
Murata Manufacturing Co., Ltd.: *See*—
NIshikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Yamashita, Sadao, 4,151,494, Cl. 333-204.000.
Ogawa, Toshio; Nishiyama, Hiroshi; and Mashio, Tasuku, 4,151,324, Cl. 428-432.000.
Murchison, Craig B.; and Murdick, Dewey A., to Dow Chemical Company, The. Process for producing C_2–C_4 hydrocarbons from carbon monoxide and hydrogen. 4,151,190, Cl. 260-449.00R.
Murdick, Dewey A.: *See*—
Murchison, Craig B.; and Murdick, Dewey A., 4,151,190, Cl. 260-449.00R.
Murray, Robert M. S.: *See*—
Pitches, Brian E.; and Murray, Robert M. S., 4,150,767, Cl. 222-23.000.
Murrell, Lawrence L.: *See*—
Oswald, Alexis A.; and Murrell, Lawrence L., 4,151,114, Cl. 252-430.000.
Muschi, Johann: *See*—
More, Anton; Riedle, Rudolf; Straussberger, Herbert; Streckel, Willi; and Muschi, Johann, 4,151,264, Cl. 423-348.000.
Muslinkin, Abdurakhim A.: *See*—
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Maltyl-2-methyl alkenoates and novel perfume compositions and perfumed articles containing same. 4,151,181, Cl. 260-345.80R.
Myers, John W., to Phillips Petroleum Company. Dehydrocyclization process. 4,151,071, Cl. 208-135.000.
Myers, Richard L.: *See*—
Fite, Wade L.; and Myers, Richard L., 4,151,414, Cl. 250-281.000.
Nagahara, Shusaku: *See*—
Saito, Kazuhiro; Ozawa, Naoki; and Nagahara, Shusaku, 4,151,552, Cl. 358-41.000.
Nagaishi, Hatuo: *See*—
Suzuki, Suzuo; Masaki, Kenji; and Nagaishi, Hatuo, 4,150,647, Cl. 123-119.00E.
Nagasawa, Masao, to Nippondenso Co., Ltd. Contactless ignition system for internal combustion engine. 4,150,652, Cl. 123-148.0CC.
Nagengast, Werner: *See*—
Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, 4,151,338, Cl. 526-185.000.
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, to Bristol-Myers Company. 7-Amino-3-(2-carboxyalkyl-2,3-dihydro-s-triazolo[4,3-b]pyridazin-3-on-6-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,151,352, Cl. 544-26.000.
Naka, Hiromitsu. Flexible non-skid strip with upwardly projecting portion for stair edge. 4,151,320, Cl. 428-163.000.
Nakada, Yasuo: *See*—
Kawagai, Kenji; Yoshida, Shigeki; and Nakada, Yasuo, 4,151,546, Cl. 357-71.000.
Nakagawa, Koji: *See*—
Ichikawa, Yataro; Yoshisato, Eishin; and Nakagawa, Koji, 4,151,204, Cl. 260-584.00R.
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, to Seiko Koki Kabushiki Kaisha. Device in camera shutter for maintaining separate blades in intimate contact with each other. 4,150,890, Cl. 354-246.000.
Nakai, Masanori: *See*—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,151,019, Cl. 148-175.000.
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, to Citizen Watch Company Limited. Electronic timepiece. 4,150,536, Cl. 58-23.00D.
Nakajima, Yasuo: *See*—
Aoyama, Syunichi; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,150,646, Cl. 123-119.00A.
Nakamura, Junichi: *See*—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,151,019, Cl. 148-175.000.
Nakamura, Kengi. Densitometer. 4,150,899, Cl. 356-444.000.
Nakata, Josuke: *See*—
Mihashi, Yutaka; Nakata, Josuke; Sogo, Toshio; and Yamanaka, Kenichi, 4,151,011, Cl. 148-1.500.
Nakayama, Yasuaki; and Tanaka, Ryuzo, to Citizen Watch Company Limited. Dial attaching device for watch. 4,150,538, Cl. 58-88.00R.
Nalco Chemical Company: *See*—
Horembala, Louis E., 4,151,079, Cl. 210-32.000.
Hunter, Wood E.; and Sieder, Theodore P., 4,151,202, Cl. 260-567.60R.
Namimoto, Keiji: *See*—
Sugawara, Mutsuo; and Namimoto, Keiji, 4,151,611, Cl. 365-227.000.
Naniwa, Kiyoaki: *See*—
Akatsuka, Hisashi; Naniwa, Kiyoaki; Iemura, Nobukazu; and Ishida, Kazufumi, 4,151,118, Cl. 252-439.000.
Nassry, Assadullah; and Maxwell, Jerrold F., to BASF Wyandotte Corporation. Water-based hydraulic fluid and metalworking lubricant. 4,151,099, Cl. 252-32.70E.
National Catheter Corp.: *See*—
Jackson, Isaac S., 4,150,676, Cl. 128-351.000.
National Distillers and Chemical Corporation: *See*—
McClain, Dorothee M., 4,151,133, Cl. 260-23.00H.
McClain, Dorothee M., 4,151,134, Cl. 260-23.00H.
McClain, Dorothee M., 4,151,135, Cl. 260-23.00R.
National Research Development Corporation: *See*—
Gerzon, Michael A., 4,151,369, Cl. 179-1.0GQ.
Phillips, Courtenay S. G., 4,151,215, Cl. 260-677.0XA.
Nawata, Yoshiaki: *See*—
Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, 4,151,542, Cl. 357-36.000.
Neel, Jean; and Violland, Robert, to Rhone-Poulenc Industries. Water-soluble polyurethanes and compositions and application thereof to substrates. 4,150,946, Cl. 8-115.600.
Nekljudova, administrator; by Olga V.: *See*—
Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and

Nekljudova, administrator; by Olga V., 4,151,005, Cl. 136-89.0CC.

Nelson, Jerome W.: *See—*
Kushner, Cherie E.; Tews, Paul A.; and Nelson, Jerome W., 4,151,395, Cl. 219-125.120.

Nelson, Larry A., to Tektronix, Inc. Programmable color enable and sequencing system for secam. 4,151,551, Cl. 358-26.000.

Nelson, Laurence N. Automatic laboratory fume hood sash operator. 4,150,606, Cl. 98-115.0LH.

Nelson, Norman A.: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 4,151,359, Cl. 560-53.000.

Nelson Rack Company: *See—*
Nelson, Samuel, 4,151,063, Cl. 204-297.00W.

Nelson, Robert T., to Lever Brothers Company. Liquid systems. 4,151,097, Cl. 252-8.600.

Nelson, Samuel, to Nelson Rack Company. Electroplating rack. 4,151,063, Cl. 204-297.00W.

Netherton, Charles F.: *See—*
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,151,435, Cl. 310-154.000.

Netzel, Philip C.: *See—*
Brandt, Thomas F.; and Netzel, Philip C., 4,150,480, Cl. 29-628.000.

Neuberg, Rainer; Penzien, Klaus; and Matthies, Hans G., to BASF Aktiengesellschaft. Flame-retardant fibers and filaments of linear thermoplastic polyesters containing halogenated oligomer of styrene. 4,151,223, Cl. 260-873.000.

Neuschwanter, Chris F.; and Levine, Eli, to Celanese Corporation. Process for preparing all-acrylic copolymer latex. 4,151,147, Cl. 260-29.60T.

Neuser, Johannes; and Menzel, Helmut, to Hundt and Weber, Schaltgerate GmbH. Turning grip drive for rocker-arm actuated power switch. 4,151,385, Cl. 200-153.0LA.

Newport Plastics, Inc.: *See—*
Silkebakken, Jerrold W.; and Hale, Bruce H., 4,150,580, Cl. 74-5.00R.

Ney, Robert, to Lynenwerk GmbH & Co. KG. Production of cables with undulated tension relief elements. 4,151,237, Cl. 264-40.700.

NGK Spark Plug Co., Ltd.: *See—*
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, 4,150,984, Cl. 75-238.000.

Nguyen Huu, Duyet; Ballegeer, Jean-Claude; and Guedj, Richard, to Thomson-CSF. Microprogrammable control unit. 4,151,597, Cl. 364-900.000.

Nicholas, Donald C.: *See—*
Geall, Charles L.; Leese, Leonard; Nicholas, Donald C.; Smith, Gordon C. R.; and Stokes, Geoffrey F., 4,151,159, Cl. 260-42.460.

Nichols, Wayne L. Method and apparatus for joining electrical conductors to junction boxes. 4,151,363, Cl. 174-65.00R.

Nicol, Roland, deceased; and by Robinson, Helen C. Nicol, executrix, to Heinemann Electric Company. Circuit breaker grip means. 4,151,386, Cl. 200-303.000.

Nicolini, John D.; and Willard, David F., to Motorola, Inc. Data sync acquisition in an asynchronous binary address decoder. 4,151,367, Cl. 178-69.100.

Nield, Eric: *See—*
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,151,224, Cl. 260-876.00R.

Nielsen, Arnold D., to Ford Motor Company. Method and means for temperature compensation in exhaust gas sensors. 4,150,562, Cl. 73-27.00R.

Nihon Denshi Kabushiki Kaisha: *See—*
Goto, Eiichi; Souma, Takashi; Idesawa, Masanori; and Yuasa, Tetsuo, 4,151,422, Cl. 250-492.00A.

Niida, Taro: *See—*
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, 4,151,041, Cl. 195-31.00P.

Nikkiso Co., Ltd.: *See—*
Tsutsui, Toshiaki; Oyamada, Akira; Hamaguchi, Tomomitsu; and Agata, Akihiko, 4,150,916, Cl. 415-143.000.

Niks, Anton: *See—*
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and van der Sijpt, Gerardus F., 4,150,965, Cl. 71-27.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Deutsch, Ralph, 4,150,600, Cl. 84-1.110.
Yokoyama, Kenji, 4,151,477, Cl. 330-107.000.

Nippon Light Metal Company Limited: *See—*
Ishikawa, Tatsuo; Konda, Shoichi; Iuchi, Toshiaki; and Ichikawa, Hachiro, 4,151,061, Cl. 204-247.000.

Nippon Soken, Inc.: *See—*
Hinachi, Matatoyo; and Miki, Kiyoshi, 4,151,526, Cl. 343-7.0VM.

Nippon Steel Corporation: *See—*
Sanuki, Shin-ichi; Ueda, Yuziro; Yoshida, Toru; Kume, Tomoaki; and Ikenouchi, Kosaburo, 4,150,973, Cl. 75-60.000.

Nippondenso Co., Ltd.: *See—*
Nagasawa, Masao, 4,150,652, Cl. 123-148.0CC.

Nishi, Yoshio: *See—*
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,151,019, Cl. 148-175.000.

NIshikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Yamashita, Sadao, to Murata Manufacturing Co., Ltd. Electrical filter. 4,151,494, Cl. 333-204.000.

Nishimatsu, Kazuo: *See—*
Shioi, Hideji; Furukawa, Tsuneo; Kouchi, Hiroaki; and Nishimatsu, Kazuo, 4,150,936, Cl. 425-397.000.

Nishimiya, Torazo: *See—*
Sasayama, Takao; Nishimiya, Torazo; and Sakamoto, Shinichi, 4,150,643, Cl. 123-119.0EC.

Nishiyama, Hiroshi: *See—*
Ogawa, Toshio; Nishiyama, Hiroshi; and Mashio, Tasuku, 4,151,324, Cl. 428-432.000.

Nissan Motor Company, Limited: *See—*
Aoyama, Syunichi; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,150,646, Cl. 123-119.00A.
Masaki, Kenji; and Maruoka, Hiroyuki, 4,150,644, Cl. 123-119.00E.
Suekane, Junnosuke, 4,150,699, Cl. 139-370.200.
Suzuki, Suzuo; Masaki, Kenji; and Nagaishi, Hatuo, 4,150,647, Cl. 123-119.00E.

Nogami, Kouji: *See—*
Fukuma, Nobuo; Kato, Yoshito; and Nogami, Kouji, 4,151,450, Cl. 318-317.000.

Noguchi, Hiroshi: *See—*
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.

Noguchi, Matsusaburo: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 4,150,620, Cl. 101-114.000.

Nogueira, Eduardo D.; Abad, Angel L. R.; Muntadas, Manuel B.; and Vega, Jose M. R. Process for elimination of mercury from industrial waste waters by means of extraction with solvents. 4,151,077, Cl. 210-21.000.

Nohara, Akira; Umetani, Tomonobu; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. Chromone derivatives. 4,151,180, Cl. 260-345.200.

Nomura, Yasushi: *See—*
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, 4,150,536, Cl. 58-23.00D.

Norfin, Inc.: *See—*
Vaughn, Wade, 4,150,453, Cl. 11-3.000.

Norris, Richard J. Metals recovery apparatus. 4,151,062, Cl. 204-273.000.

Northern Telecom Limited: *See—*
Hupe, Gerard J., 4,151,429, Cl. 307-355.000.
Lewandowski, Ted J., 4,151,493, Cl. 333-216.000.

Northrop Corporation: *See—*
Vaughn, Thomas R., 4,150,579, Cl. 74-5.00R.

Northrup, Daniel; and Hess, Steven, to Saunders Photo/Graphic Inc. Photographic easel system. 4,150,895, Cl. 355-74.000.

Northrup, Thomas A.: *See—*
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,151,593, Cl. 364-200.000.

Northup, Francis B., to Hanes Corporation. Method of making elastic yarn. 4,150,529, Cl. 57-6.000.

Northwood Mills Ltd.: *See—*
Fang, Henry H., 4,151,002, Cl. 106-123.0TQ.

Norton, Barton F.: *See—*
Merkel, Stephen L.; Small, Charles B.; and Norton, Barton F., 4,150,886, Cl. 352-166.000.

Norwood, William L. Gas well controller system. 4,150,721, Cl. 166-53.000.

Nosco Plastics, Inc.: *See—*
Cloyd, Harold S., 4,150,496, Cl. 34-238.000.

Novak, Walter M. Apparatus for cleaning moving abrasive members. 4,150,512, Cl. 51-262.00A.

Novota, Rudolph J.: *See—*
Telchuk, Steve E., Jr.; Novota, Rudolph J.; and Ingham, Thomas G., 4,150,605, Cl. 98-115.0SB.

Nowack, Gerhard P.; Tabler, Donald C.; and Johnson, Marvin M., to Phillips Petroleum Company. Reclaiming used lubricating oils. 4,151,072, Cl. 208-182.000.

Noznick, Peter P.: *See—*
Ziccarelli, Salvatore F.; and Noznick, Peter P., 4,151,308, Cl. 426-613.000.

Obermaier & Cie.: *See—*
Plack, Ludwig, 4,150,448, Cl. 8-150.000.

Obermeier, Friedrich, to Dr. Th. Wieland, Firma. Photoelectric control device for gas burners. 4,150,941, Cl. 431-355.000.

O'Brien, John P.: *See—*
Allcock, Harry R.; Allen, Robert W.; and O'Brien, John P., 4,151,185, Cl. 260-429.00R.

Occidental Oil Shale, Inc.: *See—*
Cha, Chang Y.; and Bartel, William J., 4,150,722, Cl. 166-251.000.

Occidental Research Corporation: *See—*
Choi, Charles K., 4,151,044, Cl. 201-12.000.

Ochii, Kiyofumi: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,151,610, Cl. 365-222.000.

Odgers, John: *See—*
Rubins, Philip M.; and Odgers, John, 4,150,539, Cl. 60-39.230.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Dorey, Jacques A., 4,151,529, Cl. 343-106.00D.

Ofrex Group Limited: *See—*
Wright, Owen M., 4,150,774, Cl. 227-132.000.

Ogasawara, Toyotsugu, to Tomy Kogyo Co., Inc. Toy for loading a vehicle. 4,150,507, Cl. 46-40.000.

Ogawa, Iwakichi, to Takara Co., Ltd. Vehicle toy with firing mechanism. 4,150,508, Cl. 46-202.000.

Ogawa, Toshio; Nishiyama, Hiroshi; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline films and method of preparing the same. 4,151,324, Cl. 428-432.000.

Ogden, Dennis H., to British Industrial Plastics Limited. Improvements in and relating to building blocks. 4,151,239, Cl. 264-46.600.

Ogi, Keiji: *See*—
Suga, Tsuneo; Ogi, Keiji; and Egami, Kenji, 4,150,993, Cl. 96-64.000.

Ogiso, Akira: *See*—
Mishima, Hiroshi; Ogiso, Akira; and Kobayashi, Shinsaku, 4,151,357, Cl. 544-386.000.

Ogita, Tamotu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation engine for high altitude use. 4,150,648, Cl. 123-119.00A.

Ogureck, Frank M.; and Payne, Richard S., to Bell Telephone Laboratories, Incorporated. Fabrication of high speed transistors by compensation implant near collector-base junction. 4,151,009, Cl. 148-1.500.

O'Handley, Robert C., to Allied Chemical Corporation. Glassy alloys containing cobalt, nickel and iron having near-zero magnetostriction and high saturation induction. 4,150,981, Cl. 75-170.000.

O'Hare, Louis R. Direct current variable capacitance electric generator. 4,151,409, Cl. 250-212.000.

Oharek, Frank J.: *See*—
Breglia, Denis R.; Entwistle, Robert J.; Oharek, Frank J.; and Rosendahl, Gottfried R., 4,150,885, Cl. 352-130.000.

Ohio-Nuclear, Inc.: *See*—
Richey, Joseph B.; Wake, Robert H.; Wilson, Henry H.; and Cheiky, Michael C., 4,151,416, Cl. 250-363.00S.

Ohira, Takeshi; Kameyama, Tadao; Honzyo, Chihiko; Iwasa, Yuzaburo; and Hatakeyama, Takanobu, to Hitachi, Ltd. Elevator control apparatus. 4,150,734, Cl. 187-29.00R.

Ohlsson, Ingemar W., to Tetra Pak Development. Method for the manufacture of packing containers. 4,151,024, Cl. 156-69.000.

Ohnishi, Yuuji: *See*—
Amano, Kazutoshi; Suehiro, Kazuyasu; Sato, Takehiko; and Ohnishi, Yuuji, 4,151,217, Cl. 260-683.00R.

Ohrman, Timothy P., to RCA Corporation. Magnetic tape position measuring system. 4,151,566, Cl. 360-72.100.

Ohta, Hirofumi: *See*—
Saito, Nobuo; Toyooka, Takashi; Ohta, Hirofumi; and Asano, Atsushi, 4,151,608, Cl. 365-214.000.

Oisel, Andre J.: *See*—
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,151,571, Cl. 360-77.000.

Oka, Masahisa: *See*—
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,151,352, Cl. 544-26.000.

Okano, Yasuyuki: *See*—
Morinaga, Takashi; Okano, Yasuyuki; Kakefuda, Koichi; and Suzue, Kiyoyuki, 4,151,226, Cl. 260-881.000.

Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 4,150,620, Cl. 101-114.000.

Okosi, Siyouzo: *See*—
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, 4,151,111, Cl. 252-429.00B.

Okumura, Jun: *See*—
Naito, Takayuki; Okumura, Jun; Kamachi, Hajime; Iimura, Seiji; Hoshi, Hideaki; and Oka, Masahisa, 4,151,352, Cl. 544-26.000.

Okuno Chemical Industry Co., Ltd.: *See*—
Moritsu, Yukikazu; Yamada, Kooji; Wada, Masatoshi; and Munemoto, Eiji, 4,150,995, Cl. 106-1.210.

Olin Corporation: *See*—
Gavin, Edmond P., Jr., 4,150,465, Cl. 24-85.00B.

Olympus Optical Co., Ltd.: *See*—
Sato, Masaaki, 4,151,470, Cl. 325-311.000.
Tojyo, Tsutomu, 4,150,871, Cl. 350-175.0ML.

Omoto, Shoji: *See*—
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, 4,151,041, Cl. 195-31.00P.

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Imai, Yoshikiyo; and Agatahama, Syunichi, 4,151,496, Cl. 335-140.000.

Onda, Eiichi: *See*—
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,150,890, Cl. 354-246.000.

Ondetti, Miguel A.; and Petrillo, Edward W., to E. R. Squibb & Sons, Inc. Phosphonoacyl prolines and related compounds. 4,151,172, Cl. 260-326.200.

O'Neill, John F., to Bell Telephone Laboratories, Incorporated. PCM coder with shifting idle channel noise level. 4,151,516, Cl. 340-347.0CC.

Onizawa, Masao, to Sanyo Trading Co., Ltd. Method of treating textiles with a curable composition of an acrylic copolymer. 4,150,945, Cl. 8-115.600.

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Onsager, Olav T., to Halcon International, Inc. Dimerization process. 4,151,197, Cl. 260-465.80D.

Onulak, Eugene W., to Allied-Locke Industries, Incorporated. Chain link and method for forming the same. 4,150,583, Cl. 74-248.000.

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Lee, Henry L., Jr.; Orlowski, Jan A.; and Kidd, Patrick D., 4,150,485, Cl. 32-15.000.

Ormet Corporation: *See*—
Lafleur, Alonzo D.; Creehan, John T.; and Baugh, Robert E., 4,150,952, Cl. 23-301.000.

Ormond, A. Newman. Strain gauge flexure isolated weighing scale. 4,150,729, Cl. 177-211.000.

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Orr, Willis P., to Exxon Production Research Company. Pre-loading joint flanges. 4,150,477, Cl. 29-526.00R.

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Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,151,302, Cl. 424-317.000.
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, 4,151,294, Cl. 424-283.000.

Osborne, J. Scott, Jr.; Hartung, Homer A.; and Bebbs, Joseph F., Jr., to Philip Morris Incorporated. Treatment of tobacco. 4,150,677, Cl. 131-8.00R.

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Othmer, Donald F. Separation of components of a fluid mixture. 4,151,075, Cl. 210-7.000.

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Smith, Clay D.; and Keller, Douglas V., Jr., 4,151,003, Cl. 106-278.000.

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Barzilai, Giorgio; Maltese, Paolo; and Ottavi, Cesare M., 4,150,878, Cl. 350-344.000.

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Pelagio, Gregory A.; Stalego, Charles J.; and Holland, Wiley B., 4,150,937, Cl. 425-464.000.

Owens-Illinois, Inc.: *See*—
Barry, James W.; and Dickson, Andrew C., 4,151,250, Cl. 264-532.000.
Hofmann, William E.; and Long, Alton W., 4,150,964, Cl. 65-181.000.
Lee, Soo-Il, 4,151,249, Cl. 264-520.000.

Owens, James C.: *See*—
Howe, Dennis G.; Blazey, Richard N.; and Owens, James C., 4,150,880, Cl. 350-358.000.

Oyamada, Akira: *See*—
Tsutsui, Toshiaki; Oyamada, Akira; Hamaguchi, Tomomitsu; and Agata, Akihiko, 4,150,916, Cl. 415-143.000.

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Sato, Kazuhiro; Ozawa, Naoki; and Nagahara, Shusaku, 4,151,552, Cl. 358-41.000.

Pachter, John J. Engine. 4,150,544, Cl. 60-527.000.

Packard, Thomas N.; and Burns, Richard C. System for reducing noise transients. 4,151,471, Cl. 325-473.000.

Padmanabhan, Subramaniam: *See*—
Hasler, Werner; Lennemann, Eckart; and Padmanabhan, Subramaniam, 4,150,619, Cl. 101-93.330.

Palmer, Alfred M., to Peds Products, Inc. Foot cover and blank therefor. 4,150,498, Cl. 36-10.000.

Palmieri, Angelo; and Salicini, Sandro, to Carle & Montanari S.p.A. Device for feeding articles. 4,150,520, Cl. 53-225.000.

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Collins, Paul W.; and Pappo, Raphael, 4,151,187, Cl. 260-429.700.

Papst, Georg F.: *See*—
von der Heide, Johann; and Papst, Georg F., 4,151,447, Cl. 318-135.000.

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von der Heide, Johann; and Papst, Georg F., 4,151,447, Cl. 318-135.000.

Park, Kisoon, to Union Carbide Corporation. Radiation curable coating compositions containing alkanediones or cycloalkanediones. 4,151,056, Cl. 204-159.160.

Parker, Phillip H.: *See*—
Bacskai, Robert; and Parker, Phillip H., 4,151,221, Cl. 260-857.0PE.

Pashkurov, Nikolai G.: *See*—
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.

Patella, Ralph F., to Celanese Corporation. Process for preparing multifunctional acrylate-modified vinyl ester-alkyl acrylate/methacrylate copolymer coagulum-free latex. 4,151,146, Cl. 260-29.60T.

Paton, Hamilton N. K.; Skilling, John B.; and Smith, Frank F., to Paton, Hamilton Neil King; and Skilling, John B. Self-contained frictionally damped resilient suspension system for railcars. 4,150,627, Cl. 105-224.00A.

Paton, Hamilton Neil King: *See*—
Paton, Hamilton N. K.; Skilling, John B.; and Smith, Frank F., 4,150,627, Cl. 105-224.00A.

Patrylow, Michael F.: *See—*
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., 4,151,055, Cl. 204-159.150.

Patton, Jon R., to Clark Equipment Company. Inching valve. 4,150,737, Cl. 192-13.00R.

Patton, Robert J.; and Schrank, Martin P., to GTE Sylvania Incorporated. Apparatus and method of making filaments. 4,150,708, Cl. 164-72.000.

Paul, James L.; Pieper, Wendell L.; and Wade, Leslie E., to Celanese Corporation. Reduction of catalyst deactivation in processes for hydroformylation of olefins with rhodium complex catalysts. 4,151,209, Cl. 260-604.0HF.

Payne, Richard S.: *See—*
Ogureck, Frank M.; and Payne, Richard S., 4,151,009, Cl. 148-1.500.

Payton, Raymond A., to Helix International Limited. Drawing compass. 4,150,486, Cl. 33-27.00B.

Pazdirek, Jiri V., to Textron Inc. Punch stripper. 4,150,452, Cl. 10-11.00E.

Pearson, Eugene W.; and Short Wilbur G., to Canron, Inc. Apparatus for handling cuttings from a shear. 4,150,594, Cl. 83-91.000.

Pease, Hugh R.; Agardy, Franklin J.; and Josephson, Elliot, to Hutec Corporation. Load control apparatus. 4,151,515, Cl. 340-309.100.

Peddie, Gerald D.: *See—*
Goad, Robert C.; Krohn, Fritz F. W.; and Peddie, Gerald D., 4,151,031, Cl. 156-201.000.

Pedersen, August B., to Mobil Oil Corporation. Water-in-oil detection device. 4,151,256, Cl. 422-102.000.

Peds Products, Inc.: *See—*
Palmer, Alfred M., 4,150,498, Cl. 36-10.000.

Pelagio, Gregory A.; Stalego, Charles J.; and Holland, Wiley B., to Owens-Corning Fiberglas Corporation. Apparatus for forming filaments. 4,150,937, Cl. 425-464.000.

Penick, Monroe. Ultrasonic device for scaring animals from a moving vehicle. 4,150,637, Cl. 116-58.00R.

Pentaject Corporation, The: *See—*
Gabrys, Kenneth F., 4,150,931, Cl. 425-186.000.

Penzien, Klaus: *See—*
Neuberg, Rainer; Penzien, Klaus; and Matthies, Hans G., 4,151,223, Cl. 260-873.000.

Perkins, Gerald S., to California Institute of Technology. Fast acting check valve. 4,150,925, Cl. 417-418.000.

Perner, Johannes; Frey, Guenter; Helfert, Herbert; and Fikentscher, Rolf, to BASF Aktiengesellschaft. Process for suppressing the foaming of detergents. 4,151,127, Cl. 252-542.000.

Peters, James; and Meyer, Victor E., to Dow Chemical Company, The. Styrene-butadiene interpolymer latex based cement additives containing a silane. 4,151,150, Cl. 260-29.70R.

Peters, Karl-Heinz: *See—*
Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,150,818, Cl. 266-193.000.

Peters, Margot Elizabeth: *See—*
Peters, Melville F.; and Peters, Walter T., 4,150,660, Cl. 126-270.000.

Peters, Melville F.; and Peters, Walter T., to Peters, Margot Elizabeth; and Kronman, Albert F. Easy access energy conversion panels for solar heating systems. 4,150,660, Cl. 126-270.000.

Peters, Philip H., Jr., to Environment/One Corporation. Metal base cookware induction heating apparatus having improved power control circuit for insuring safe operation. 4,151,387, Cl. 219-10.49R.

Peters, Walter T.: *See—*
Peters, Melville F.; and Peters, Walter T., 4,150,660, Cl. 126-270.000.

Peterson, Glen. Ferromagnetic marker pairs for detecting objects having marker secured thereto, and method and system for activating, deactivating and using same. 4,151,405, Cl. 235-382.000.

Peterson, Wesley R.: *See—*
Brown, Jack; Herr, John A.; Peterson, Wesley R.; and Wurst, John W., 4,150,634, Cl. 112-275.000.

Petrillo, Edward W.: *See—*
Ondetti, Miguel A.; and Petrillo, Edward W., 4,151,172, Cl. 260-326.200.

PFZ Enterprises Inc.: *See—*
Zuuring, Peter F., 4,150,837, Cl. 280-11.120.

Pharmachem Corporation: *See—*
Watt, William E. R., 4,150,673, Cl. 128-272.000.

Philagro: *See—*
Crochemore, Michel, 4,151,193, Cl. 260-453.00P.

Philip Morris Incorporated: *See—*
Osborne, J. Scott, Jr.; Hartung, Homer A.; and Bebbs, Joseph F., Jr., 4,150,677, Cl. 131-8.00R.

Phillips, Courtenay S. G., to National Research Development Corporation. Methods and applications of preparative scale chromatography. 4,151,215, Cl. 260-677.0XA.

Phillips, Patrick A., to Keltek Processing, Inc. Process for stripping photographic materials. 4,150,977, Cl. 75-118.00P.

Phillips Petroleum Company: *See—*
Doss, Richard C.; and Reusser, Robert E., 4,151,344, Cl. 528-34.000.
McDaniel, Max P.; and Welch, Melvin B., 4,151,122, Cl. 252-458.000.
Myers, John W., 4,151,071, Cl. 208-135.000.
Nowack, Gerhard P.; Tabler, Donald C.; and Johnson, Marvin M., 4,151,072, Cl. 208-182.000.
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,151,023, Cl. 156-62.200.

Photopulos, Georgia M. Cushioned retainer pads for wigs. 4,150,678, Cl. 132-53.000.

Picciotto, Frank: *See—*
Kaufman, Edward; Picciotto, Frank; and Beck, Jack, 4,151,382, Cl. 200-61.710.

Pieper, Wendell L.: *See—*
Paul, James L.; Pieper, Wendell L.; and Wade, Leslie E., 4,151,209, Cl. 260-604.0HF.

Pierce, Jim D.: *See—*
Morris, Marvin E.; Pierce, Jim D.; and Whitfield, Willis J., 4,151,419, Cl. 250-453.000.

Pifferi, Giorgio: *See—*
Sale, Amedeo O.; Pifferi, Giorgio; Consonni, Pietro; Diena, Alberto; and DelTurco, Bonaccorso R., 4,151,169, Cl. 260-308.00R.

Pitches, Brian E.; and Murray, Robert M. S., to Ferranti Limited. Liquid blending and dispensing apparatus. 4,150,767, Cl. 222-23.000.

Pitney Bowes, Inc.: *See—*
Wakeman, William G., 4,150,896, Cl. 355-75.000.

Plack, Ludwig, to Obermaier & Cie. Process of dyeing flocked textile fibers. 4,150,448, Cl. 8-150.000.

Plank, Charles J.: *See—*
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., 4,151,189, Cl. 260-448.00C.

Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., to Phillips Petroleum Company. Method for the production of a nonwoven fabric. 4,151,023, Cl. 156-62.200.

Platt, Vernon H.; and Wilmot, Richard D., to Hughes Aircraft Company. Clutter mapper logic system. 4,151,523, Cl. 343-5.0DP.

Plattner, Werner, executor: *See—*
Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased; Schaumann, Wolfgang; and Stegmeier, Karlheinz, 4,151,303, Cl. 424-319.000.

Playart Limited: *See—*
Tong, Duncan, 4,150,789, Cl. 238-10.00E.

Plummer, Mace E. Sportsman's seat. 4,150,733, Cl. 182-187.000.

Plummer, Noel: *See—*
Slinn, David S. L.; and Plummer, Noel, 4,150,493, Cl. 34-9.000.

Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M. Polymer composition and method of using same to produce thermostable insulating materials. 4,151,158, Cl. 260-42.260.

Pohl, Walter J., to General Electric Company. Method for forming a variable restrictor. 4,150,558, Cl. 72-367.000.

Pokorny, Joseph E.; and Keller, Richard N. Portable stage. 4,150,630, Cl. 108-64.000.

Polaroid Corporation: *See—*
Karger, Eva R.; and MacGregor, Paul T., 4,151,174, Cl. 260-326.13R.
Zinchuk, Michael, 4,151,560, Cl. 358-214.000.

Polinsky, Murray A.; and Lewis, William N., to RCA Corporation. Nonvolatile semiconductive memory device and method of its manufacture. 4,151,538, Cl. 357-23.000.

Poncha, Rustom P.; and Gancy, Alan B., to Allied Chemical Corporation. Method of preparing sodium liquors low in calcium. 4,151,261, Cl. 423-206.00T.

Pontre, Gilbert, to CEFILAC. Tester of dry dielectric strength for insulated electric cable. 4,151,461, Cl. 324-54.000.

Poore, Bernard B., to Deere & Company. Vehicular single shaft gas turbine engine power system. 4,150,565, Cl. 73-133.00R.

Pooser, A. Keith, Jr., to Envirotech Corporation. Moveable top seal for an eliminator sheet core. 4,150,960, Cl. 55-440.000.

Popl, Milan: *See—*
Minarik, Milan; Popl, Milan; and Mostecky, Jiri, 4,150,563, Cl. 73-61.10C.

Porsche AG: *See—*
Hensler, Paul; Eyb, Wolfgang; Hetmann, Richard; and Burst, Hermann, 4,151,508, Cl. 340-64.000.

Portec, Inc.: *See—*
Qureshi, Khurshid A., 4,150,792, Cl. 238-349.000.

Possler, Harald: *See—*
Loffler, Reinhard; and Possler, Harald, 4,150,595, Cl. 83-171.000.

Post Office, The: *See—*
Hensel, Paul C., 4,151,030, Cl. 156-158.000.

Poticha, Zinoviy I.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,150,971, Cl. 75-10.00R.

Potter, Edward, to Potter, Edward; and Dant & Russell, Inc. Reinforced molded lignocellulosic crosstie and railway assembly. 4,150,790, Cl. 238-83.000.

Power-Science, Inc.: *See—*
Cooper, Edward, 4,151,464, Cl. 324-103.00P.

PPG Industries, Inc.: *See—*
Imler, Vaughn R., 4,150,963, Cl. 65-114.000.
Rideout, Walker H., 4,151,212, Cl. 260-659.00A.

Praga, Claudio: *See—*
di Salle, Enrico; Praga, Claudio; and Castegnaro, Erminia, 4,151,283, Cl. 424-261.000.

Pressiat, Robert, to Thomson-CSF. System for controlling ground movements on airfields. 4,151,595, Cl. 364-439.000.

Prestley, John S., Jr.: *See*—
Thompson, David S.; Prestley, John S., Jr.; and Webb, Thomas E., 4,151,013, Cl. 148-11.50A.

Pretsch, Edwin R.; and Cipris, Jan, to Steel Company of Canada, Limited, The. Imbricating a group of flat bars. 4,150,742, Cl. 198-459.000.

Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Process for the selective preparation of acetaldehyde from methanol and synthesis gas. 4,151,208, Cl. 260-601.00R.

Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., to Allied Chemical Corporation. Method of estimating energy loss from pneumatic tires. 4,150,567, Cl. 73-146.000.

Price, Edward G., to Beehive International. Security timer device. 4,151,426, Cl. 307-141.000.

Price-Falcon, Juan F.; MacKay, Patrick W.; Martinez-Vera, Enrique R.; and Guerra-Garcia, Gilberto, to Fierro Esponja, S.A. Controlling carburization in the reduction of iron ore to sponge iron. 4,150,972, Cl. 75-35.000.

Probstein, Ronald F.; and Yung, David, to Water Purification Associates. Lamella separators. 4,151,084, Cl. 210-97.000.

Procter & Gamble Company, The: *See*—
Lucas, Malcolm B.; and Van Coney, Robert H., 4,151,240, Cl. 264-504.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Bachelard, Roland; Barral, Robert; Lamalle, Maurice; and Koeppel, Robert, 4,151,000, Cl. 106-109.000.

Proizvodstvennoe Obiedinenie Turbostroenia Leningradsky Metallichesky Zavod: *See*—
Khokhulin, Vladimir N.; Ladygin, Jury V.; and Shver, Valery G., 4,150,511, Cl. 51-67.000.

Promon Engenharia SA: *See*—
Maffei, Carlos E. M., 4,150,910, Cl. 405-149.000.

Properzi, Giulio. Apparatus for collecting and cooling hot wire rod. 4,150,816, Cl. 266-106.000.

Propulsion Systems, Inc.: *See*—
Wennberg, Peder K.; and Eastman, Mark E., 4,150,921, Cl. 416-207.000.

Prost-Marechal, Jacques: *See*—
Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, 4,151,195, Cl. 260-465.00D.

Puglia, Giuseppe: *See*—
Casnati, Giuseppe; Casiraghi, Giovanni; Puglia, Giuseppe; Sartori, Giovanni; and Terenghi, Giuliana, 4,151,201, Cl. 260-562.00A.

Pugliese, Leonard A.: *See*—
Simkovich, Ales; and Pugliese, Leonard A., 4,151,012, Cl. 148-11.50N.

Puhak, Peter G., to GTE Sylvania Incorporated. Cathode support means in electron gun structure of a cathode ray tube. 4,151,441, Cl. 313-446.000.

Puskas, Ferenc. Process for producing alumina. 4,151,267, Cl. 423-626.000.

Quantor Corporation: *See*—
Meadows, John W.; and Ritter, Robert J., 4,150,992, Cl. 96-49.000.

Quick, Leonard M.: *See*—
McCollum, John D.; and Quick, Leonard M., 4,151,068, Cl. 208-11.0LE.

Quigley, Richard J.: *See*—
Reynolds, Clarke; and Quigley, Richard J., 4,150,791, Cl. 238-282.000.

Qureshi, Khurshid A., to Portec, Inc. Rail fastener. 4,150,792, Cl. 238-349.000.

R & I Patent Corporation: *See*—
Gubelmann, William S., deceased; Gubelmann, Walter S., executor; and Grier, William R., 4,150,901, Cl. 400-4.000.

Raasch, Hans, to W. Schlafhorst & Co. Method and apparatus for exchanging sliver cans. 4,150,534, Cl. 57-281.000.

Racz, Gabor B. Tennis training device. 4,150,821, Cl. 273-29.00A.

Radiometer A/S: *See*—
Sorensen, Soren K.; and Holbek, Carl C., 4,151,108, Cl. 252-408.000.

Raible, Hermann, to Mathias Bauerle GmbH. Printing press having plurality of separable inking mechanisms. 4,150,621, Cl. 101-207.000.

Rasberger, Michael: *See*—
Evans, Samuel; and Rasberger, Michael, 4,151,356, Cl. 544-195.000.

Rasp, Christian; and Scharfe, Gerhard, to Bayer Aktiengesellschaft. Process for the catalytic conversion of organic chlorine compounds. 4,151,262, Cl. 423-240.000.

Rau, Rama N., to Schlumberger Technology Corporation. Microwave method and apparatus for determination of adsorbed fluid in subsurface formations. 4,151,457, Cl. 324-6.000.

Ravizza, Raymond F.; and Wheeler, James R., to Ampex Corporation. Automatic scan tracking using a magnetic head supported by a piezoelectric bender element. 4,151,570, Cl. 360-77.000.

Raytheon Company: *See*—
Bowen, Robert F., 4,150,657, Cl. 126-271.000.
Sandy, Frank; and Dunnrowicz, Clarence J., 4,151,492, Cl. 333-191.000.
Wallace, Ronald M., 4,151,488, Cl. 331-107.00R.

RCA Corporation: *See*—
Bazin, Lucas J., 4,151,490, Cl. 333-16.000.
Khanna, Sarwan K., 4,151,132, Cl. 260-23.0XA.
Kongelka, Robert M.; and Buess, Paul L., 4,151,467, Cl. 325-15.000.
Kratz, Jerrold K.; and Christensen, Edward W., II, 4,151,561, Cl. 358-248.000.
Ohrman, Timothy P., 4,151,566, Cl. 360-72.100.
Polinsky, Murray A.; and Lewis, William N., 4,151,538, Cl. 357-23.000.
Robe, Thomas J., 4,151,482, Cl. 330-308.000.
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Ream, Ronald L.; and Moore, David M., to Wm. Wrigley Jr. Company. Chewing gum composition. 4,151,270, Cl. 424-48.000.

Rebucci, Eugene L., to Merrick Scale Mfg. Company. Apparatus for feeding granular material. 4,150,701, Cl. 141-232.000.

Reckitt & Colman Products Ltd.: *See*—
Citrone, Anthony M.; and Avery, Richard W., 4,151,138, Cl. 260-28.5AV.

Recognition Equipment Incorporated: *See*—
Hayes, Larry J., 4,150,997, Cl. 106-15.050.

Recovery Systems, Inc.: *See*—
Link, Donald F., 4,150,795, Cl. 241-33.000.

Redalum, Societe Anonyme: *See*—
David, Paul M.; and Rey, Bernard H. E., 4,151,036, Cl. 156-475.000.

Reeves, Leslie D.: *See*—
Lester, Dudley R.; and Reeves, Leslie D., 4,151,246, Cl. 264-297.000.

Reffert, Rudi W.: *See*—
Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, 4,150,719, Cl. 165-140.000.

Regan, Joseph P.; and Thomas, James R., to Dayco Corporation. Apparatus for making double angle V-belt. 4,150,928, Cl. 425-40.000.

Regelin, Donald H.; and Farrar, Jerome A., to Zimmermann & Jansen, Inc. Mixing chamber. 4,150,817, Cl. 266-139.000.

Regie Nationale des Usines Renault: *See*—
Robert, Bernard, 4,150,834, Cl. 277-88.000.

Regotti, Alfred A.: *See*—
Seese, Daniel R.; and Regotti, Alfred A., 4,151,460, Cl. 324-52.000.

Reichen, Willi, to Bolex International SA. Motion-picture camera. 4,150,884, Cl. 352-91.00C.

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Research Corporation: *See*—
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Reusser, Robert E.: *See*—
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Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.

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Rideout, Walker H., to PPG Industries, Inc. Purification of ethylene dichloride. 4,151,212, Cl. 260-659.00A.

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Riganati, John P.; and Vitols, Visvaldis A., to Rockwell International Corporation. Automatic pattern processing system. 4,151,512, Cl. 340-146.30E.

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Ritter, Robert J.: *See*—
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Robinson, Neil L.: *See*—
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LaFratta, Laurence A., 4,151,485, Cl. 331-1.00A.
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Schlaefer, Francis W., 4,151,117, Cl. 252-437.000.

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Romagnoli, Andrea. Tablet feeder for filling honeycomb-like cells of a tape. 4,150,751, Cl. 209-682.000.

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Heller, Heinz; Brand, Winfried; and Gogovic, Peter, 4,150,940, Cl. 431-130.000.

Root, John J., to Votrak Information Systems, Inc. Reception and transmission system for polling apparatus. 4,151,370, Cl. 179-2.0AS.

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Rubins, Philip M.; and Odgers, John, to Avco Corporation. Low pollution combustor. 4,150,539, Cl. 60-39.230.

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Russell, B. Carson. Compactor-strapper. 4,150,615, Cl. 100-7.000.

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Ryder, Leonard B. Method for molding materials. 4,151,236, Cl. 264-39.000.

Rys, Tadeusz J.; and DiMarco, Bernard, to Gould Inc. Resetting means for trip free circuit breaker contact operating mechanism. 4,151,495, Cl. 335-26.000.

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Schmitt, Karl; Disteldorf, Josef; and Schmitt, Flexi, 4,151,152, Cl. 260-33.6UB.

Schmitt, Frederick L.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick L., 4,151,103, Cl. 252-89.00R.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,151,181, Cl. 260-345.80R.

Schmitt, Karl; Disteldorf, Josef; and Schmitt, Flexi, to Veba-Chemie Aktiengesellschaft. Stable fast-setting varnishes based on polyesters and blocked aliphatic diisocyanate. 4,151,152, Cl. 260-33.6UB.

Schmitt, Marvin G., to AMI Industries, Inc. Utility crane. 4,150,754, Cl. 212-8.00R.

Schmitz, Albert: *See*—
De Graaff, Hendrik C.; Hart, Paul A. H.; Schmitz, Albert; and Slotboom, Jan W., 4,151,006, Cl. 148-1.500.

Schmitz, Jurgen: *See*—
Fricke, Jobst; Voigt, Wolfgang; and Schmitz, Jurgen, 4,151,368, Cl. 179-1.00M.

Schmitz, Murdock E.: *See*—
Waggoner, Clinton A.; and Schmitz, Murdock E., 4,151,253, Cl. 422-68.000.

Schnall, Gunther; Schlick, Erich; and Blochl, Hanns, to AGFA-Gevaert A.G. Toner dispensing device for an electrostatic copier. 4,150,892, Cl. 355-3.0DD.

Schneider, Franz; and Braitinger, Helmut, to L. Schuler GmbH. Method of controlling the speed of a mechanical press. 4,150,616, Cl. 100-35.000.

Schnepf, Dietmar; Reindl, Klaus; Gruner, Heiko; and Vogel, Friedrich, to Robert Bosch GmbH. Semiconductor electric circuit device with plural-layer aluminum base metallization. 4,151,545, Cl. 357-71.000.

Schnurbusch, Horst: *See*—
Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, 4,151,338, Cl. 526-185.000.

Schoenmetz, Wilhelm. Lock and alarm apparatus. 4,151,506, Cl. 340-63.000.

Schofield, James W., to Liquid Terminals, Inc. Process for preparation of sulfur nuggets for storage and transportation. 4,151,234, Cl. 264-13.000.

Scholl, Hans, to Kochs Adler AG. Adjustable template for sewing device. 4,150,489, Cl. 33-177.000.

Schramm, Eugene J.; and Geisel, Jacob C., Jr., to Somat Corporation. Modular split screen hydro-extractor. 4,150,617, Cl. 100-117.000.

Schramm, Heinz-Helmut: *See*—
Rolff, Klaus-Peter; and Schramm, Heinz-Helmut, 4,151,391, Cl. 200-147.00R.

Schrank, Martin P.: *See*—
Patton, Robert J.; and Schrank, Martin P., 4,150,708, Cl. 164-72.000.

Schreiber, James N.; and Bumgardner, Donald L., to Burroughs Corporation. Modular, semiautomatic credit card reader/writer apparatus. 4,151,564, Cl. 360-2.000.

Schreiber, William L.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.

Schubert, John C.: *See*—
Cyr, Steven J.; and Schubert, John C., 4,150,777, Cl. 229-2.50R.

Schulz-Kaiser, Eckhard: *See*—
Schlueter, Karl W.; and Schulz-Kaiser, Eckhard, 4,151,274, Cl. 424-80.000.

Schuster, Hans-Dieter: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; and Gabler, Rolf, 4,150,954, Cl. 48-102.00A.

Schwartz, Dale R. Automatic round bale wrapping assembly. 4,150,614, Cl. 100-5.000.

Schwarz, Richard A.: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,151,222, Cl. 260-857.00G.

Schwarzmann, Gunter: *See*—
Lurssen, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,150,967, Cl. 71-92.000.

Science Accessories Corp.: *See*—
Howells, Joseph A., 4,151,596, Cl. 364-709.000.

Scriver, Robert E.: *See*—
Howell, Thomas H.; Scriver, Robert E.; and Circello, Joseph C., 4,151,510, Cl. 340-146.1AL.

Seaclean SA: *See*—
Bolli, Peter; and Asper, Jean-Jacques, 4,151,081, Cl. 210-83.000.

Seager, William H., to Harco Corporation. Closely spaced pipe-to-soil electrical survey method and apparatus. 4,151,458, Cl. 324-9.000.

Seese, Daniel R.; and Regotti, Alfred A., to Westinghouse Electric Corp. High resistance ground fault detector and locator for polyphase electrical systems. 4,151,460, Cl. 324-52.000.

Segawa, Takashi; and Katayama, Hitoshi, to Shimano Industrial Company, Ltd. Chain wheel and crank for a bicycle. 4,150,859, Cl. 308-23.500.

Seib, Paul A.; Cousins, Raymond C.; and Hoseney, Russell C., to Kansas State University Research Foundation. Method of synthesizing fatty acid esters of ascorbic acid. 4,151,178, Cl. 260-343.700.

Seiko Koki Kabushiki Kaisha: *See*—
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,150,890, Cl. 354-246.000.

Sekiya, Fukuo: *See*—
Morokawa, Shigeru; Sekiya, Fukuo; and Hashimoto, Yukio, 4,150,535, Cl. 58-23.00R.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Low temperature curing epoxy ester copolymers. 4,151,131, Cl. 260-19.0EP.

Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane preparation and use thereof. 4,151,053, Cl. 204-98.000.

Seuter, Antonius M. J. H.: *See*—
van den Boom, Petrus F. J.; and Seuter, Antonius M. J. H., 4,151,443, Cl. 313-486.000.

Sextro, Gunter; Burg, Karlheinz; Schlaf, Helmut; Leugering, Hans J.; and Heller, Alwin, to Hoechst Aktiengesellschaft. Process for preparing oxymethylene polymers in a granular form. 4,151,346, Cl. 528-230.000.

Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,151,131, Cl. 260-19.0EP.

Sharma, Raj K.: *See*—
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,150,567, Cl. 73-146.000.

Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; and Kuwagaki, Hiroshi, 4,151,326, Cl. 428-447.000.
Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, 4,151,543, Cl. 357-65.000.

Shattuck, Meredith D., to International Business Machines Corporation. Image forming process involving phase change. 4,150,985, Cl. 96-1.00R.

Shell Oil Company: *See*—
Kim, Leo; and Wald, Milton M., 4,151,214, Cl. 260-676.00R.
St. Clair, David J.; and Hansen, David R., 4,151,057, Cl. 204-159.170.

Shepherd, William H.: *See*—
Sander, Wendell B.; and Shepherd, William H., 4,151,540, Cl. 357-34.000.

Shepherd, William L., to Hughes Tool Company. Downcrowding device for earth boring machines. 4,150,727, Cl. 173-147.000.

Sherwood Medical Industries Inc.: *See*—
Brush, Donald C., 4,150,666, Cl. 128-2.00F.

Shibagaki, Masahiro: *See*—
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,151,034, Cl. 156-345.000.

Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. AG-Metal oxides electrical contact materials containing internally oxidized indium oxides and/or tin oxides. 4,150,982, Cl. 75-173.00A.

Shiga, Masaaki; Misumi, Teruyuki; and Tanaka, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparation of N,N'-disubstituted-4,4'-bipyridylium salt. 4,151,165, Cl. 546-257.000.

Shimada, Satoshi: *See*—
Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, 4,151,502, Cl. 338-2.000.

Shimano Industrial Company, Ltd.: *See*—
Segawa, Takashi; and Katayama, Hitoshi, 4,150,859, Cl. 308-23.500.

Shin-Etsu Chemical Co., Ltd.: *See*—
Itoh, Kunio; and Fukuda, Takeshi, 4,151,156, Cl. 260-37.0SB.

Shinohara, Kazuhiro: *See*—
Yano, Naomichi; Shinohara, Kazuhiro; and Sato, Joe, 4,150,933, Cl. 425-219.000.

Shinozaki, Satoshi: *See*—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,151,019, Cl. 148-175.000.

Shioi, Hideji; Furukawa, Tsuneo; Kouchi, Hiroaki; and Nishimatsu, Kazuo, to Hitachi, Ltd. Apparatus for press forming shadow masks. 4,150,936, Cl. 425-397.000.

Shiseido Co., Ltd.: *See*—
Torii, Kenji; and Tomita, Kenichi, 4,151,269, Cl. 424-47.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kosugui, Seiji, 4,150,695, Cl. 137-625.640.

Shomura, Takashi: *See*—
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, 4,151,041, Cl. 195-31.00P.

Short, Wilbur G., to Canron, Inc. Hydraulic hold-down circuit. 4,150,596, Cl. 83-380.000.

Short, Wilbur G.: *See*—
Pearson, Eugene W.; and Short, Wilbur G., 4,150,594, Cl. 83-91.000.

Shtukareva, Valeria B.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.

Shuster, Edward J.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick L., 4,151,103, Cl. 252-89.00R.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Schmitt, Frederick L.; and Shuster, Edward J., 4,151,181, Cl. 260-345.80R.

Shver, Valery G.: *See*—
Khokhulin. Vladimir N.; Ladygin, Jury V.; and Shver, Valery G., 4,150,511, Cl. 51-67.000.
Siclari, Anthony. Meatball maker. 4,150,459, Cl. 17-32.000.
Sieder, Theodore P.: *See*—
Hunter, Wood E.; and Sieder, Theodore P., 4,151,202, Cl. 260-567.60R.
Siegel, Frederick P.: *See*—
Anderson, Gilbert L., Jr.; and Siegel, Frederick P., 4,151,001, Cl. 106-270.000.
Siemens Aktiengesellschaft: *See*—
Dorsemagen, Stephan; and Eiting, Hermann, 4,151,568, Cl. 360-75.000.
Dorsemagen, Stephen; and Eiting, Hermann, 4,151,567, Cl. 360-75.000.
Hammer, Hansjorg, 4,151,588, Cl. 364-106.000.
Kobale, Manfred; Krueger, Hans; and Lorenz, Hans-Peter, 4,150,877, Cl. 350-341.000.
Rolff, Klaus-Peter; and Schramm, Heinz-Helmut, 4,151,391, Cl. 200-147.00R.
Udvardi-Lakos, Janos, 4,151,586, Cl. 363-57.000.
von der Neyen, Jans-Jurgen, 4,151,475, Cl. 329-105.000.
Siemon Company, The: *See*—
Knickerbocker, Robert H., 4,150,867, Cl. 339-97.00P.
Sigidin, Yakov A.: *See*—
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.
Sigma Chemical Company: *See*—
Bhattacharyya, Rabindra N., 4,151,043, Cl. 195-103.50R.
Sigsbee, Raymond A., to General Electric Company. Nb_3Ge Superconductive films. 4,151,329, Cl. 428-607.000.
Sigsbee, Raymond A., to General Electric Company. Mb_3Ge Superconductive films grown with nitrogen. 4,151,330, Cl. 428-607.000.
Sih, John C., to Upjohn Company, The. 7,8-Didehydro-PGI$_1$ compounds. 4,151,351, Cl. 542-426.000.
Sijthoff, Jan Piet t., to Ballast-Nedam Groep N.V.; Amsterdamse Ballast Bagger en Grond; and B.V. en Scheepswerf en Machinefabrick "de liesbosch" B.V. Method and apparatus for breaking up lumps of stone from a subaqueous soil. 4,150,502, Cl. 37-58.000.
Silkebakken, Jerrold W.; and Hale, Bruce H., to Newport Plastics, Inc. Gyroscopic exerciser. 4,150,580, Cl. 74-5.00R.
Silverman, Daniel; and Johnson, Everett A. Access authentication system. 4,150,781, Cl. 235-382.000.
Silvestri, George J., Jr., to Westinghouse Electric Corp. Rotor cooling for single and double axial flow turbines. 4,150,917, Cl. 415-168.000.
Silvon, Michael P.: *See*—
Anzenberger, Joseph F., Sr.; and Silvon, Michael P., 4,151,101, Cl. 252-49.600.
Simane, Zdenek: *See*—
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, 4,151,294, Cl. 424-283.000.
Simkovich, Ales; and Pugliese, Leonard A., to Latrobe Steel Company. High strength, corrosion resistant tubular products and methods of making the same. 4,151,012, Cl. 148-11.50N.
Simms, John A., to Du Pont de Nemours, E. I., and Company. Acrylic graft copolymers and coating compositions thereof. 4,151,227, Cl. 260-885.000.
Simon-Hartley Limited: *See*—
Austin, Eric P.; and Robertson, William S., 4,151,231, Cl. 261-91.000.
Simon, Wilbur. Elimination of overflow of sewer systems. 4,150,683, Cl. 137-1.000.
Simpson, Catherine L. Paint brush scraper. 4,150,763, Cl. 220-90.000.
Singer Company, The: *See*—
Adams, Kenneth D., 4,150,633, Cl. 112-260.000.
Brown, Jack; Herr, John A.; Peterson, Wesley R.; and Wurst, John W., 4,150,634, Cl. 112-275.000.
Singer, Malcolm S., to Chevron Research Company. Fungicidal N-carbamyloxy-2,3-disubstituted 4-trihalomethyl-6-oxotetrahydro-1,3-oxazines. 4,151,279, Cl. 424-248.500.
Singleton, Thomas C., to Monsanto Company. Catalysis of water-gas shift reaction. 4,151,107, Cl. 252-373.000.
Sinha, Ashok K.: *See*—
Levinstein, Hyman J.; and Sinha, Ashok K., 4,151,007, Cl. 148-1.500.
Sink, Marshall E. Air tube game apparatus. 4,150,830, Cl. 273-265.000.
Sirotinsky, Petr S.: *See*—
Vasiliev, Evgeny A.; Sirotinsky, Petr S.; Ivanov, Dmitry P., deceased; and Ivanov, Vitaly D., administrator, 4,150,979, Cl. 75-130.00R.
Sisson, Kenneth J. Solar energy collector and concentrator. 4,150,663, Cl. 126-271.000.
Skierski, Edwin J., to USM Corporation. Die holder assembly. 4,150,451, Cl. 10-9.000.
Skilling, John B.: *See*—
Paton, Hamilton N. K.; Skilling, John B.; and Smith, Frank F., 4,150,627, Cl. 105-224.00A.
Slinn, David S. L.; and Plummer, Noel, to I.S.C. Chemicals Limited. Drying of articles. 4,150,493, Cl. 34-9.000.
Slobodyanik, Ivan P. Column for heat- and mass exchange between gas or steam and liquid. 4,151,232, Cl. 261-114.00R.
Slotboom, Jan W.: *See*—
De Graaff, Hendrik C.; Hart, Paul A. H.; Schmitz, Albert; and Slotboom, Jan W., 4,151,006, Cl. 148-1.500.
Sluka, Virgil W. Relative displacement measurement apparatus. 4,150,490, Cl. 33-180.00R.
Small, Charles B.: *See*—
Merkel, Stephen L.; Small, Charles B.; and Norton, Barton F., 4,150,886, Cl. 352-166.000.
Small, Edward B. Method of manufacturing pre-cast concrete panels. 4,151,244, Cl. 264-228.000.
Smee, Gordon E. A.; and Jackman, Raymond W., to Joseph Bradbury & Sons Limited. Apparatus for baling hay or straw. 4,150,613, Cl. 100-3.000.
Smith, Charles W., Jr.; Walker, William H.; and Zimmerman, Franz X., to Autoclave Engineers, Inc. Autoclave furnace with mechanical circulation. 4,151,400, Cl. 219-400.000.
Smith, Chester A., to General Electric Company. Electrical insulator for slotted magnetic cores. 4,151,436, Cl. 310-215.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Viscosity modification of bituminous materials. 4,151,003, Cl. 106-278.000.
Smith, Colin W.: *See*—
Dawson, William; Foulis, Michael J.; Gutteridge, Norman J. A.; and Smith, Colin W., 4,151,199, Cl. 562-504.000.
Smith, David L.; and Scherr, Norman J., Jr., to Inovex Corporation. Method for grinding. 4,150,513, Cl. 51-281.00R.
Smith, David R., to Union Oil Company of California. Vinylidene chloride polymer latices. 4,151,149, Cl. 260-29.6SQ.
Smith, David S., to Technicon Instruments Corporation. Immunoassay for gentamicin. 4,150,949, Cl. 23-230.00B.
Smith, Dean L., Jr.; and Tarmy, Barry L., to Exxon Research & Engineering Co. Slurry mixer. 4,150,900, Cl. 366-302.000.
Smith, Edward D.: *See*—
Wade, James A.; and Smith, Edward D., 4,150,651, Cl. 123-140.0FG.
Smith, Frank F.: *See*—
Paton, Hamilton N. K.; Skilling, John B.; and Smith, Frank F., 4,150,627, Cl. 105-224.00A.
Smith, Gordon C. R.: *See*—
Geall, Charles L.; Leese, Leonard; Nicholas, Donald C.; Smith, Gordon C. R.; and Stokes, Geoffrey F., 4,151,159, Cl. 260-42.460.
Smith, Herman W., to Upjohn Company, The. 2,2-Difluoro-13,14-didehydro-PGE$_1$ compounds. 4,151,184, Cl. 260-408.000.
Smith International, Inc.: *See*—
Bolton, Jimmie B., 4,151,018, Cl. 148-127.000.
Garner, Lloyd L.; Herrick, George R.; and Harris, Charles R., 4,150,728, Cl. 175-374.000.
Smith, John R.: *See*—
Sackoff, Martin M.; Smith, John R.; and Walling, Billy E., 4,151,319, Cl. 428-40.000.
Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,151,288, Cl. 424-270.000.
Durant, Graham J.; and Ganellin, Charon R., 4,151,289, Cl. 424-273.00R.
Smith, Lynton R., to Canada Packers Limited. Preparation of high-quality gelatine having low chromium content from chromed waste stock. 4,151,161, Cl. 260-118.000.
Smith & Nephew Pharmaceuticals Ltd.: *See*—
Fennimore, Jack, 4,150,744, Cl. 206-205.000.
Smith, Robert E.: *See*—
McNeilly, Michael A., 4,150,443, Cl. 2-436.000.
Smith, Vernon C., to Hercules Incorporated. Catalytic cracking of by-product polypropylene. 4,151,216, Cl. 260-683.0PD.
Snamprogetti S.p.A.: *See*—
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,151,110, Cl. 252-429.00C.
Snia Viscosa S.p.A. Societa Nazionale Industria Applicazioni Viscosa: *See*—
Cozzi, Ennio; and Tardani, Massimo, 4,151,335, Cl. 521-138.000.
Snyder, Clair W., Jr.; Derr, Paul B.; and Wycheck, Thomas H., to AMP Incorporated. Environmentally sealed connector. 4,150,866, Cl. 339-94.00M.
Societa' Farmaceutici Italia S.p.A.: *See*—
di Salle, Enrico; Praga, Claudio; and Castegnaro, Erminia, 4,151,283, Cl. 424-261.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Bambara, Mario; and Cotroneo, Francesco, 4,151,375, Cl. 179-18.0ES.
Societe Anonyme DBA: *See*—
Verne, Michel, 4,150,569, Cl. 73-302.000.
S.A. des Anciens Etablissements Paul Wurth: *See*—
Legille, Edouard; and Mahr, Rene, 4,151,047, Cl. 202-262.000.
Societe Lab: *See*—
Vicard, Jean-Francois, 4,151,091, Cl. 210-243.000.
Societe Manzoni-Bouchot: *See*—
Manzoni, Stephane N., 4,150,585, Cl. 74-501.00M.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Hoch, Rene G.; Jubelin, Bernard J. L.; Sarlat, Pierre M. A.; and Thomas, Pierre, 4,150,732, Cl. 181-213.000.
Lesgourgues, Jacques, 4,150,776, Cl. 228-194.000.
Sogo, Toshio: *See*—
Mihashi, Yutaka; Nakata, Josuke; Sogo, Toshio; and Yamanaka, Kenichi, 4,151,011, Cl. 148-1.500.

Somat Corporation: *See*—
Schramm, Eugene J.; and Geisel, Jacob C., Jr., 4,150,617, Cl. 100-117.000.
Sons, Charles C., Jr., to Caterpillar Tractor Co. Belt separation-resistant tire configuration. 4,150,703, Cl. 152-361.00R.
Sony Corporation: *See*—
Iida, Mikio; and Hosoya, Mitsuru, 4,151,557, Cl. 358-188.000.
Ueno, Yoshikazu; and Hirano, Seiichi, 4,150,893, Cl. 355-18.000.
Sorensen, Soren K.; and Holbek, Carl C., to Radiometer A/S. Reference liquid for blood gas equipment. 4,151,108, Cl. 252-408.000.
Souma, Takashi: *See*—
Goto, Eiichi; Souma, Takashi; Idesawa, Masanori; and Yuasa, Tetsuo, 4,151,422, Cl. 250-492.00A.
Southard, James S., to C. G. Conn, Ltd. Digital keying system for an electronic musical instrument. 4,150,599, Cl. 84-1.030.
Spanke, Edwin A.; and Carrieri, Louis F., to Gulf & Western Manufacturing Company. Press having slide shut height adjusting and locking mechanism. 4,150,618, Cl. 100-257.000.
Spears, Marvin C. Fluid transmission unit and braking system. 4,150,542, Cl. 60-330.000.
Spector, Sidney, to Hoffmann-La Roche Inc. Barbituric acid antigens and antibodies specific therefor. 4,151,268, Cl. 424-1.000.
Sperry Rand Corporation: *See*—
Butler, L. Dennis, 4,150,756, Cl. 414-40.000.
De Busscher, Cyriel R. J.; Dekeyzer, Marcel A.; and van Herpe, Francois, 4,150,525, Cl. 56-14.600.
Swygert, Wilbert E., Jr., 4,151,519, Cl. 340-517.000.
Torok, Ernest J., 4,151,606, Cl. 365-172.000.
Spindelfabrik Sussen Schurr, Stahlecker & Grill GmbH: *See*—
Griesinger, Rolf; and Rienhardt, Manfred, 4,150,462, Cl. 19-294.000.
Spire Corporation: *See*—
Kirkpatrick, Allen R., 4,151,008, Cl. 148-1.500.
Sprague Electric Company: *See*—
Bernard, Walter J.; and Ross, Sidney D., 4,151,581, Cl. 361-433.000.
Sprague, Michael J.: *See*—
Engelbach, Heinz; Wistuba, Hermann; Sprague, Michael J.; Sturm, Hans-Juergen; and Armbrust, Herbert, 4,151,182, Cl. 260-369.000.
Sprecker, Mark A.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Sprenger, William A.: *See*—
Brewbaker, James L.; and Sprenger, William A., 4,151,219, Cl. 260-836.000.
Srp, Jim W., Jr., to Sun Petroleum Products Company. Pipe fitting reconditioning apparatus. 4,150,815, Cl. 266-57.000.
Stach, Kurt, deceased: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased; Schaumann, Wolfgang; and Stegmeier, Karlheinz, 4,151,303, Cl. 424-319.000.
Stachiw, Jerry D.; and Horn, George M., to United States of America, Navy. Pressure-resistant housing. 4,150,875, Cl. 350-319.000.
Stahl, Charles J.; Armstrong, Bruce L.; and Moore, David M., to Armstrong Store Fixture Corporation. Merchandise display fixture. 4,150,753, Cl. 211-105.100.
Stalego, Charles J.: *See*—
Pelagio, Gregory A.; Stalego, Charles J.; and Holland, Wiley B., 4,150,937, Cl. 425-464.000.
Standard Oil Company, The: *See*—
Isley, Ralph, 4,151,151, Cl. 260-30.40N.
Standard Oil Company (Indiana): *See*—
Cyr, Steven J.; and Schubert, John C., 4,150,777, Cl. 229-2.50R.
Fields, Ellis K., 4,151,213, Cl. 260-669.00R.
McCollum, John D.; and Quick, Leonard M., 4,151,068, Cl. 208-11.0LE.
Stanley Works, The: *See*—
Hildebrandt, William J., 4,150,484, Cl. 30-254.000.
Stark, Richard A., to AVX Corporation. Chip capacitor device. 4,151,579, Cl. 361-308.000.
Stark, William H., to General Electric Company. Dynamoelectric machine structures. 4,151,430, Cl. 310-90.000.
Stauffer Chemical Company: *See*—
Anzenberger, Joseph F., Sr.; and Silvon, Michael P., 4,151,101, Cl. 252-49.600.
Stebbing, Nowell; and Eaton, Michael A., to G. D. Searle & Co. Poly-5-hydroxycytidylic acid copolymers. 4,151,350, Cl. 536-29.000.
Steel Company of Canada, Limited, The: *See*—
Pretsch, Edwin R.; and Cipris, Jan, 4,150,742, Cl. 198-459.000.
Steel Radiators Limited: *See*—
Renshaw, Edward J.; and Blissett, Michael J., 4,150,938, Cl. 431-67.000.
Stegmeier, Karlheinz: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased; Schaumann, Wolfgang; and Stegmeier, Karlheinz, 4,151,303, C 424-319.000.
Stein, Robert G., to Abbott Laboratories. Insecticidal pyrazole-4-methanol esters. 4,151,293, Cl. 424-273.00P.
Steingroever, Erich A., to Magnetfabrik Bonn, GmbH vormals Gewerkschaft Windhorst. Mold for the production of anisotropic permanent magnets. 4,150,927, Cl. 425-3.000.
Stepanova, Nadezhda M.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.
Stern, Nathan, to Bobst-Champlain, Inc. LEL (lower explosive limit) control with automatic calibration capability. 4,150,495, Cl. 34-54.000.
Stern, Nathan, to Bobst-Champlain, Inc. Web tension control for high-speed web handling equipment. 4,151,594, Cl. 364-400.000.
Stetz, John W., to GTE Sylvania Incorporated. Small phosphor area black matrix fabricating process. 4,150,990, Cl. 96-36.100.
Stevens, Walter W. Ore concentrator table support. 4,150,749, Cl. 209-437.000.
Stewart, Paul. Roller applicator with pressure responsive valve. 4,150,904, Cl. 401-186.000.
Stewart, Robert E.: *See*—
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,151,593, Cl. 364-200.000.
Stipanuk, John M.: *See*—
Krafthefer, Kerry M.; and Stipanuk, John M., 4,150,863, Cl. 339-17.0LC.
Stokes, Geoffrey F.: *See*—
Geall, Charles L.; Leese, Leonard; Nicholas, Donald C.; Smith, Gordon C. R.; and Stokes, Geoffrey F., 4,151,159, Cl. 260-42.460.
Stollenwerk, Joseph A.; and Muhs, Reinhard. Printing roller. 4,150,022, Cl. 101-378.000.
Stratemeier, Ulrich: *See*—
Maertins, Horst; Rothfuss, Peter; Maier, Gernot; and Stratemeier, Ulrich, 4,151,451, Cl. 318-568.000.
Stratmann, Josef; and Strobel, Manfred, to Carl Still Recklinghausen, Firma. Settling unit for circulated coke quenching water. 4,151,082, Cl. 210-83.000.
Strauch, Raymond; and Tomasi, Jean-Pierre, to Telecommunications Radioelectriques et Telephoniques T.R.T. Radio-electric system for locating a given object. 4,151,525, Cl. 343-6.50R.
Straussberger, Herbert: *See*—
More, Anton; Riedle, Rudolf; Straussberger, Herbert; Streckel, Willi; and Muschi, Johann, 4,151,264, Cl. 423-348.000.
Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and Neklјudova, administrator; by Olga V. Radiation hardened semiconductor photovoltaic generator. 4,151,005, Cl. 136-89.0CC.
Streckel, Willi: *See*—
More, Anton; Riedle, Rudolf; Straussberger, Herbert; Streckel, Willi; and Muschi, Johann, 4,151,264, Cl. 423-348.000.
Striebig, Ludwig. Circular saw for cutting panels. 4,150,597, Cl. 83-471.300.
Strobel, Dwight W. Rotary stalk chopper apparatus. 4,150,724, Cl. 172-328.000.
Strobel, Manfred: *See*—
Stratmann, Josef; and Strobel, Manfred, 4,151,082, Cl. 210-83.000.
Struger, Odo J.; Bremenour, Edwin L.; Burns, James F.; and Jerva, Ronald E., to Allen-Bradley Company. Circuit board assembly with disconnect arm. 4,151,580, Cl. 361-415.000.
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., to Union Carbide Corporation. Radiation curable adhesive compositions. 4,151,055, Cl. 204-159.150.
Sturm, Hans-Juergen: *See*—
Engelbach, Heinz; Wistuba, Hermann; Sprague, Michael J.; Sturm, Hans-Juergen; and Armbrust, Herbert, 4,151,182, Cl. 260-369.000.
Suchanek, Walton F., Jr.: *See*—
Dyroff, David R.; Suchanek, Walton F., Jr.; and Schiff, Thomas G., 4,151,271, Cl. 424-48.000.
Suehiro, Kazuyasu: *See*—
Amano, Kazutoshi; Suehiro, Kazuyasu; Sato, Takehiko; and Ohnishi, Yuuji, 4,151,217, Cl. 260-683.00R.
Suekane, Junnosuke, to Nissan Motor Company, Limited. Weft yarn sensor. 4,150,699, Cl. 139-370.200.
Suga, Shigeru. Colorimeter employing primary filter mirrors. 4,150,898, Cl. 561-405.000.
Suga, Tsuneo; Ogi, Keiji; and Egami, Kenji, to Konishiroku Photo Industry Co., Ltd. Process for forming a direct positive image. 4,150,993, Cl. 96-64.000.
Sugawara, Mutsuo; and Namimoto, Keiji, to Tokyo Shibaura Electric Co., Ltd. Power supply control system for memory systems. 4,151,611, Cl. 365-227.000.
Sugihara, Yasumasa, to General Corporation, The. Color television camera. 4,151,553, Cl. 358-44.000.
Suginuma, Atsushi: *See*—
Sayo, Kosaku; Tani, Seijiro; and Suginuma, Atsushi, 4,150,738, Cl. 192-84.00C.
Sugiyama, Takahiro, to Asahi Kogyo Kabushiki Kaisha. Miniature and large aperture wide-angle photographing lens. 4,150,872, Cl. 350-214.000.
Suling, Carlhans: *See*—
Lindner, Christian; Korte, Siegfried; El Sayed, Aziz; and Suling, Carlhans, 4,151,228, Cl. 260-898.000.
Sumi, Masahiko, to Vlsi Technology Research Association. Method for compressing pattern data and data compression processing circuit for radiant beam exposure apparatuses. 4,151,421, Cl. 250-492.00A.
Sumita, Tsuneyo: *See*—
Koga, Yoshio; Sumita, Tsuneyo; Inoue, Nobuo; and Matsuura, Susumu, 4,151,442, Cl. 313-467.000.

Sumitomo Chemical Company, Limited: *See*—
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, 4,151,290, Cl. 424-273.00R.
Sumitomo, Yasusuke: *See*—
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,151,034, Cl. 156-345.000.
Summers, Verl R. Solar energy structure. 4,150,662, Cl. 126-271.000.
Sun Oil Company: *See*—
Zupanick, Joseph E., 4,150,561, Cl. 73-23.000.
Sun Petroleum Products Company: *See*—
Srp, Jim W., Jr., 4,150,815, Cl. 266-57.000.
Sunbeam Corporation: *See*—
Beck, William P.; and Carr, Francis L., 4,150,482, Cl. 30-43.900.
Sussex Plastics Engineering Inc.: *See*—
Sansone, Leonard F., 4,151,242, Cl. 264-177.00R.
Sutton, David G.: *See*—
Capelle, Gene A.; Sutton, David G.; and Benson, Sidney W., 4,150,951, Cl. 23-232.00E.
Suzue, Kiyoyuki: *See*—
Morinaga, Takashi; Okano, Yasuyuki; Kakefuda, Koichi; and Suzue, Kiyoyuki, 4,151,226, Cl. 260-881.000.
Suzuki, Haruo: *See*—
Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, 4,151,313, Cl. 427-98.000.
Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Data transfer control system. 4,151,592, Cl. 364-200.000.
Suzuki, Shigehiko; and Imaiida, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Induction motor control system. 4,151,453, Cl. 318-762.000.
Suzuki, Suzuo; Masaki, Kenji; and Nagaishi, Hatuo, to Nissan Motor Company, Limited. Feedback fuel supply control system having electrostatic flow rate regulator for internal combustion engine. 4,150,647, Cl. 123-119.00E.
Suzuki, Takashi, to Matsushita Electric Industrial Co., Ltd. Method for stretching a thermo-softening high molecular film. 4,151,245, Cl. 264-288.000.
Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. High density semiconductor memory device formed in a well and having more than one capacitor. 4,151,610, Cl. 365-222.000.
Suzuki, Yukio: *See*—
Inada, Masami; Hashimoto, Kenji; and Suzuki, Yukio, 4,150,642, Cl. 123-119.00A.
Svatikov, Jury N.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,151,158, Cl. 260-42.260.
Svenska Rayon Aktiebolaget: *See*—
Reinhardt, Hans; and Troeng, Bengt T., 4,151,076, Cl. 210-21.000.
Svensson, Tommy E.: *See*—
Jansson, Erik L.; and Svensson, Tommy E., 4,151,518, Cl. 340-347.00C.
Svoboda, Harry J.: *See*—
El Sherif, Fouad; and Svoboda, Harry J., 4,150,686, Cl. 137-377.000.
Swartz, Robert B. Apparatus for measuring excess pore water pressure. 4,150,578, Cl. 73-725.000.
Sweeley, Charles C.: *See*—
Ries, Stanley K.; and Sweeley, Charles C., 4,150,970, Cl. 71-122.000.
Swift, Harold E.: *See*—
Wu, Ching-Yong; and Swift, Harold E., 4,151,194, Cl. 260-464.000.
Swinny, Jerry E. Buzzer warning circuit for automobile lights. 4,151,505, Cl. 340-52.00D.
Swiss Aluminium Ltd.: *See*—
Baur, Rudolf, 4,151,102, Cl. 252-56.00R.
Swygert, Wilbert E., Jr., to Sperry Rand Corporation. Protective circuit for compass repeater amplifier systems. 4,151,519, Cl. 340-517.000.
Synek, Joseph: *See*—
Young, James W.; and Synek, Joseph, 4,150,968, Cl. 71-93.000.
Syntex (U.S.A.) Inc.: *See*—
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,151,297, Cl. 424-304.000.
Systron-Donner Corporation: *See*—
Magorien, Vincent G., 4,150,575, Cl. 73-422.00R.
Sziklai, George C. Transverse track magnetic transducing heads. 4,151,591, Cl. 360-115.000.
Tabler, Donald C.: *See*—
Nowack, Gerhard P.; Tabler, Donald C.; and Johnson, Marvin M., 4,151,072, Cl. 208-182.000.
Taisan Industrial Co., Ltd.: *See*—
Toyoda, Akira, 4,150,924, Cl. 417-417.000.
Takada, Juichiro, to Takata Kojyo Co., Ltd. Acceleration responsive automatic locking safety belt retractor. 4,150,799, Cl. 242-107.40A.
Takahashi, Koji: *See*—
Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, 4,151,542, Cl. 357-36.000.
Takahashi, Shuichi. Positioning control apparatus. 4,151,449, Cl. 318-138.000.
Takahashi, Takazo: *See*—
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.
Takahata, Kei; and Murakami, Hajime, to Ishihara Sangyo Kaisha, Ltd. Doped TiO_2 electrophotographic photosensitive materials. 4,150,986, Cl. 96-1.50R.
Takamatsu, Tetsuo: *See*—
Tsuchiya, Hideshi; Takamatsu, Tetsuo; Furushima, Masakazu; and Hojo, Shiro, 4,150,966, Cl. 71-78.000.
Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 4,150,508, Cl. 46-202.000.
Takata Kojyo Co., Ltd.: *See*—
Takada, Juichiro, 4,150,799, Cl. 242-107.40A.
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, to Sumitomo Chemical Company, Limited. Fungicidal 1-cycloalkylcarbonyl-3-(3,5-dihalophenyl)imidazolidine-2,4-diones. 4,151,290, Cl. 424-273.00R.
Takeda Chemical Industries, Ltd.: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,151,042, Cl. 195-96.000.
Nohara, Akira; Umetani, Tomonobu; and Sanno, Yasushi, 4,151,180, Cl. 260-345.200.
Takeguchi, Milton M.; and Weetall, Howard H., to Corning Glass Works. Transport system for clinical specimens. 4,150,950, Cl. 23-230.00B.
Takenouchi, Mutsuo, to Fuji Xerox Co., Ltd. Image storage and optical read-out device having striped electrodes. 4,151,604, Cl. 365-109.000.
Takeuchi, Toshio. Rotary foot-operated massaging device. 4,150,667, Cl. 128-25.00B.
Takigawa, Tadahiro, to Vlsi Technology Research Association. Electron beam exposure apparatus. 4,151,417, Cl. 250-396.00R.
Talbert, James E., to Morrison Textile Machinery Co. Method and apparatus for washing textile fabric. 4,150,449, Cl. 8-151.000.
Talbot, Edward B., to Ruckluft Patent AG. Valves for use in a cooling tower installation. 4,151,230, Cl. 261-25.000.
Tamura, Sadahiro: *See*—
NIshikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Yamashita, Sadao, 4,151,494, Cl. 333-204.000.
Tan, Stephen R.: *See*—
May, Geoffrey J.; and Tan, Stephen R., 4,151,235, Cl. 264-13.000.
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, to NGK Spark Plug Co., Ltd. Tungsten carbide-base sintered alloys and method for production thereof. 4,150,984, Cl. 75-238.000.
Tanaka, Jouji: *See*—
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.
Tanaka, Ryuzo: *See*—
Nakayama, Yasuaki; and Tanaka, Ryuzo, 4,150,538, Cl. 58-88.00R.
Tanaka, Takashi: *See*—
Shiga, Masaaki; Misumi, Teruyuki; and Tanaka, Takashi, 4,151,165, Cl. 546-257.000.
Tanaka, Toru: *See*—
Kanoh, Natsuki; Tanaka, Toru; and Enokido, Nobuo, 4,151,337, Cl. 526-116.000.
Tandon Magnetics Corp.: *See*—
Tandon, Sirjang L.; Hackney, Alfred C.; and Applequist, Roy A., 4,151,573, Cl. 360-104.000.
Tandon, Sirjang L.; Hackney, Alfred C.; and Applequist, Roy A., to Tandon Magnetics Corp. Magnetic recording device for double sided media. 4,151,573, Cl. 360-104.000.
Tani, Seijiro: *See*—
Sayo, Kosaku; Tani, Seijiro; and Suginuma, Atsushi, 4,150,738, Cl. 192-84.00C.
Tanida, Seiichi: *See*—
Higashide, Eiji; Asai, Mitsuko; and Tanida, Seiichi, 4,151,042, Cl. 195-96.000.
Tannenbaum, Wesley. Locking device. 4,150,731, Cl. 180-114.000.
Tanoshima, Katsuhide: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, 4,150,620, Cl. 101-114.000.
Tardani, Massimo: *See*—
Cozzi, Ennio; and Tardani, Massimo, 4,151,335, Cl. 521-138.000.
Tarmy, Barry L.: *See*—
Smith, Dean L., Jr.; and Tarmy, Barry L., 4,150,900, Cl. 366-302.000.
Tarpley, William B., Jr., to Energy and Minerals Research Co. Mine roof and wall inspection apparatus and method. 4,150,576, Cl. 73-594.000.
Taudt, Heinz: *See*—
Gast, Uwe; and Taudt, Heinz, 4,151,563, Cl. 358-298.000.
Tayco Developments, Inc.: *See*—
Taylor, Douglas P., 4,150,819, Cl. 267-136.000.
Taylor, Douglas P., to Tayco Developments. Inc. Recoil-counter-recoil system. 4,150,819, Cl. 267-136.000.
Taylor, John B.: *See*—
Rowlands, David A.; and Taylor, John B., 4,151,280, Cl. 424-250.000.
Taylor, John C. Terminal mounting means for thermally actuated switches. 4,151,501, Cl. 337-89.000.
Technicon Instruments Corporation: *See*—
Smith, David S., 4,150,949, Cl. 23-230.00B.
Teepak, Inc.: *See*—
Dowell, Arthur M.; and Judd, Henry E., 4,150,697, Cl. 138-118.100.
Teijin Limited: *See*—
Ichikawa, Yataro; Yoshisato, Eishin; and Nakagawa, Koji, 4,151,204, Cl. 260-584.00R.

Tektronix, Inc.: *See*—
Jenness, Timothy A., 4,151,444, Cl. 315-1.000.
Nelson, Larry A., 4,151,551, Cl. 358-26.000.

Telchuk, Steve E., Jr.; Novota, Rudolph J.; and Ingham, Thomas G., to Binks Manufacturing Company. Damper arrangement for a traveling spray booth. 4,150,605, Cl. 98-115.0SB.

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Strauch, Raymond; and Tomasi, Jean-Pierre, 4,151,525, Cl. 343-6.50R.

Teledyne Industries, Inc.: *See*—
De Luca, Carlo B., 4,151,392, Cl. 219-118.000.
Grimm, Thomas; and Ewald, Douglas, 4,151,092, Cl. 210-256.000.

Telefonaktiebolaget L M Ericsson: *See*—
Jansson, Erik L.; and Svensson, Tommy E., 4,151,518, Cl. 340-347.00C.

Templeton, William B.: *See*—
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Tenma, Satoru: *See*—
Miyake, Hiroshi; Tenma, Satoru; Sato, Nobuyoshi; and Honda, Akira, 4,150,975, Cl. 75-101.00R.

Terenghi, Giuliana: *See*—
Casnati, Giuseppe; Casiraghi, Giovanni; Puglia, Giuseppe; Sartori, Giovanni; and Terenghi, Giuliana, 4,151,201, Cl. 260-562.00A.

Tetra Pak Development: *See*—
Ohlsson, Ingemar W., 4,151,024, Cl. 156-69.000.

Tews, Paul A.: *See*—
Kushner, Cherie E.; Tews, Paul A.; and Nelson, Jerome W., 4,151,395, Cl. 219-125.120.

Texaco Inc.: *See*—
Arnold, Dan M., 4,151,413, Cl. 250-270.000.

Texas Instruments Incorporated: *See*—
Bayard, Michel L., 4,150,879, Cl. 350-357.000.
McBride, Lyle E.; Delagi, Richard G.; and Trenkler, George, 4,151,407, Cl. 250-199.000.
McElroy, David J., 4,151,020, Cl. 148-187.000.
McElroy, David J., 4,151,021, Cl. 148-187.000.

Textron Inc.: *See*—
El Sherif, Fouad; and Svoboda, Harry J., 4,150,686, Cl. 137-377.000.
Pazdirek, Jiri V., 4,150,452, Cl. 10-11.00E.

Teyler, A. Lee. Electrical test probe having a spring biased clip with an extendable and retractable tip movable within the clip. 4,151,462, Cl. 324-72.500.

Th. Goldschmidt AG: *See*—
Fock, Jurgen; and Buhler, Helmut, 4,151,315, Cl. 427-258.000.
Muller, Wolfgang; and Witzke, Lothar, 4,151,257, Cl. 423-24.000.

Thaler, Warren A., to Exxon Research & Engineering Co. Halogenated organoaluminum compounds and method of preparation. 4,151,113, Cl. 252-429.00R.

Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., to Exxon Research & Engineering Co. High unsaturation butyl rubbers. 4,151,343, Cl. 526-308.000.

Theijsmeijer, Frederik, to Rexnord Inc. Double flexing chain. 4,150,584, Cl. 74-255.00R.

Theis, James V., Jr., to Hollymatic Corporation. Pressure gas engine. 4,150,918, Cl. 415-202.000.

Theiss, John B.: *See*—
Jewett, Warren R.; Theiss, John B.; and Adler, Lawrence, 4,150,670, Cl. 128-188.000.

Thermo Kinetics, Inc.: *See*—
Wyman, Floyd H., 4,151,094, Cl. 210-396.000.

Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, to BASF Aktiengesellschaft. Process and apparatus for controlled and gentle heating or cooling of viscous solutions or melts of thermoplastics. 4,150,719, Cl. 165-140.000.

Thomas, James R.: *See*—
Regan, Joseph P.; and Thomas, James R., 4,150,928, Cl. 425-40.000.

Thomas, Pierre: *See*—
Hoch, Rene G.; Jubelin, Bernard J. L.; Sarlat, Pierre M. A.; and Thomas, Pierre, 4,150,732, Cl. 181-213.000.

Thompson, David S.; Prestley, John S., Jr.; and Webb, Thomas E., to Reynolds Metals Company. Aluminum-magnesium alloys sheet exhibiting improved properties for forming and method aspects of producing such sheet. 4,151,013, Cl. 148-11.50A.

Thomson-CSF: *See*—
d'Auria, Luigi, 4,150,870, Cl. 350-96.160.
Grancoin, Bernard, 4,150,653, Cl. 123-148.00E.
Kaplan, Daniel; and Velasco, Gonzalo, 4,151,058, Cl. 204-192.00S.
Nguyen Huu, Duyet; Ballegeer, Jean-Claude; and Guedj, Richard, 4,151,597, Cl. 364-900.000.
Pressiat, Robert, 4,151,595, Cl. 364-439.000.

Thouvenin, Maurice: *See*—
Grassin, Jerome; Thouvenin, Maurice; and Epie, Jean-Claude, 4,150,874, Cl. 350-292.000.

Thurman, Duane E., to Union Carbide Corporation. Carbamoyl halide compositions. 4,151,353, Cl. 544-159.000.

Thurnauer, William, to Julius Blum & Co., Inc. Stanchion connector assembly. 4,150,907, Cl. 403-234.000.

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Buhler, Hans-Eugen; Robusch, Gunter; Schafer, Herbert; and Peters, Karl-Heinz, 4,150,818, Cl. 266-193.000.

Tice, Edward S.: *See*—
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Tiger, Howard L. Warm air weathermask. 4,150,671, Cl. 128-212.000.

Timken Company, The: *See*—
Harbottle, William E., 4,150,468, Cl. 29-148.40C.

Tobioka, Takashi, to Fuji Photo Optical Co., Ltd. Film feeding device for sound motion picture camera. 4,150,881, Cl. 352-27.000.

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Tojyo, Tsutomu, to Olympus Optical Co., Ltd. Microscope objective lens system. 4,150,871, Cl. 350-175.0ML.

Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing integrated injection logic semiconductor devices utilizing self-aligned double-diffusion techniques. 4,151,019, Cl. 148-175.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Iinuma, Kazuhiro; and Abe, Yukito, 4,150,573, Cl. 73-362.0AR.
Kawagai, Kenji; Yoshida, Shigeki; and Nakada, Yasuo, 4,151,546, Cl. 357-71.000.
Koga, Yoshio; Sumita, Tsuneyo; Inoue, Nobuo; and Matsuura, Susumu, 4,151,442, Cl. 313-467.000.
Sugawara, Mutsuo; and Namimoto, Keiji, 4,151,611, Cl. 365-227.000.
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Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,151,019, Cl. 148-175.000.
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,151,034, Cl. 156-345.000.

Tomar Corporation: *See*—
Hoggard, Anthony J., 4,150,469, Cl. 29-254.000.

Tomasi, Jean-Pierre: *See*—
Strauch, Raymond; and Tomasi, Jean-Pierre, 4,151,525, Cl. 343-6.50R.

Tomita, Kenichi: *See*—
Torii, Kenji; and Tomita, Kenichi, 4,151,269, Cl. 424-47.000.

Tomy Kogyo Co., Inc.: *See*—
Ogasawara, Toyotsugu, 4,150,507, Cl. 46-40.000.

Tong, Duncan, to Playart Limited. Connection device for toy vehicle tracks. 4,150,789, Cl. 238-10.00E.

Torii, Kenji; and Tomita, Kenichi, to Shiseido Co., Ltd. Hairdressing preparation. 4,151,269, Cl. 424-47.000.

Torok, Ernest J., to Sperry Rand Corporation. Bloch-line memory system. 4,151,606, Cl. 365-172.000.

Totten, George E.: *See*—
Williams, Thomas C.; and Totten, George E., 4,151,157, Cl. 260-42.150.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Miyake, Hiroshi; Tenma, Satoru; Sato, Nobuyoshi; and Honda, Akira, 4,150,975, Cl. 75-101.00R.

Toyoda, Akira, to Taisan Industrial Co., Ltd. Electromagnetic plunger pump. 4,150,924, Cl. 417-417.000.

Toyooka, Takashi: *See*—
Saito, Nobuo; Toyooka, Takashi; Ohta, Hirofumi; and Asano, Atsushi, 4,151,608, Cl. 365-214.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Fukuma, Nobuo; Kato, Yoshito; and Nogami, Kouji, 4,151,450, Cl. 318-317.000.
Hamada, Makoto; and Watanabe, Hiroyuki; 4,150,842, Cl. 280-661.000.
Hinachi, Matatoyo; and Miki, Kiyoshi, 4,151,526, Cl. 343-7.0VM.
Inada, Masami; Hashimoto, Kenji; and Suzuki, Yukio, 4,150,642, Cl. 123-119.00A.
Masui, Takatoshi, 4,150,641, Cl. 123-119.0EC.
Ogita, Tamotu, 4,150,648, Cl. 123-119.00A.
Yamakawa, Yoshio; and Fukumori, Yoshiki, 4,150,541, Cl. 60-276.000.

Tracy, Alan C. Precision level. 4,150,492, Cl. 33-376.000.

Tracy, Richard J., to Illinois Tool Works Inc. Buckle. 4,150,464, Cl. 24-77.00R.

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Traeger, Heinrich; Brustmann, Herbert; and Haid, Erich, to Boehringer Mannheim GmbH. Crystalline potassium salt of β-nicotinamide adenine dinucleotide phosphoric acid and method for its preparation. 4,151,349, Cl. 536-28.000.

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Metzger, Gerhard, 4,151,033, Cl. 156-235.000.

Trappeur: *See*—
Delery, Marc G., 4,150,500, Cl. 36-117.000.

Travin, Lev V. High-voltage zero-crossing detector. 4,151,427, Cl. 307-252.0UA.

Tregay, John L. Methods and apparatus for transmitting image data. 4,151,562, Cl. 358-260.000.

Trelleborg Aktiebolag: *See*—
Dyrup, Sven-Erik, 4,150,848, Cl. 285-238.000.

Trenkler, George: *See*—
McBride, Lyle E.; Delagi, Richard G.; and Trenkler, George, 4,151,407, Cl. 250-199.000.

Trepanier, Donald L.; and Britton, Thomas C., to Dow Chemical Company, The. Tricyclic compounds. 4,151,166, Cl. 260-306.70T.

Trimboli Callegari, Marino S.; and Trimboli Longetto, Antonio A. Layout for collecting solar energy applicable to acclimatizing all types of buildings. 4,150,661, Cl. 126-271.000.

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Triram Corporation: *See*—
Jacobs, Melvin J., 4,151,025, Cl. 156-71.000.
Troeng, Bengt T.: *See*—
Reinhardt, Hans; and Troeng, Bengt T., 4,151,076, Cl. 210-21.000.
Trombatore, Edward T. Spatter screen for stove. 4,150,664, Cl. 126-299.00C.
Trott, Lowell C.; and Hall, Albert E. Panel placing device. 4,150,755, Cl. 414-11.000.
Troxler, Eduard; and Luthi, Christian, to Ciba-Geigy Corporation. Quaternized 1-(pyrazolinylphenylsulphonyl)-piperazines. 4,151,163, Cl. 260-239.700.
Tru-Spoke, Inc.: *See*—
Lohmeyer, Kurt W., 4,150,854, Cl. 301-58.000.
Truesdell, Curtis A.; and Wilson, Larry F. Mullion mounting. 4,150,518, Cl. 52-804.000.
Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 4,150,461, Cl. 19-200.000.
TRW Inc.: *See*—
Fetheroff, Charles W., 4,150,577, Cl. 73-611.000.
Wieland, Howard N., Jr.; and Hammer, David H., 4,150,770, Cl. 222-146.0HE.
Tseng, Ching Y.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Tsuchiya, Hideshi; Takamatsu, Tetsuo; Furushima, Masakazu; and Hojo, Shiro, to Mitsubishi Gas Chemical Company, Inc.; and Japan Hydrazine Co., Inc. Method for cultivation of tobacco plants. 4,150,966, Cl. 71-78.000.
Tsumura, Yuzo, to Kabushiki Kaisha Komatsu Seisakusho. Internal-combustion engine governor with means to prevent unnecessary changes in engine speed due to inertia or gravity. 4,150,650, Cl. 123-140.00R.
Tsushima, Sakae: *See*—
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.
Tsutsui, Toshiaki; Oyamada, Akira; Hamaguchi, Tomomitsu; and Agata, Akihiko, to Nikkiso Co., Ltd. Axial flow inducers for hydraulic devices. 4,150,916, Cl. 415-143.000.
Tsvetkova, Elena S.: *See*—
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.
Tucker, Arthur R. Liquid coupled color-television image projector. 4,151,554, Cl. 358-60.000.
Tucker, James E.; and Meyer, Burton C., to Marvin Glass & Associates. Toy vehicle. 4,150,839, Cl. 280-771.000.
Uba, Toshio: *See*—
Hug, Leonard F.; Uba, Toshio; Frazier, Charles; and Varga, John F., 4,151,331, Cl. 429-94.000.
Uberbacher, Edward C., to International Business Machines Corporation. Electro-erosion head and manufacturing method. 4,151,535, Cl. 346-139.00C.
Uchida, Singo: *See*—
Iwamatsu, Katsuyoshi; Omoto, Shoji; Shomura, Takashi; Inoue, Shigeharu; Niida, Taro; Hisamatsu, Takashi; and Uchida, Singo, 4,151,041, Cl. 195-31.00P.
Uchino, Tetsuya; Hisasue, Michio; and Kojima, Hiroaki, to Asahi Glass Company Ltd. Process for producing fluoroelastomer and cross-linked polymer thereof. 4,151,342, Cl. 526-273.000.
Udvardi-Lakos, Janos, to Siemens Aktiengesellschaft. Method and apparatus for shutting down an inverter. 4,151,586, Cl. 363-57.000.
Ueda, Horoshi; Kawamura, Kunio; and Yamazaki, Keiji, to Minolta Camera Kabushiki Kaisha. Indicating device for single lens reflex camera. 4,150,889, Cl. 354-37.000.
Ueda, Yuziro: *See*—
Sanuki, Shin-ichi; Ueda, Yuziro; Yoshida, Toru; Kume, Tomoaki; and Ikenouchi, Kosaburo, 4,150,973, Cl. 75-60.000.
Ueno, Yoshikazu; and Hirano, Seiichi, to Sony Corporation. Apparatus for taking a photograph and method thereof. 4,150,893, Cl. 355-18.000.
Ueno, Yukio: *See*—
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.
Ultramet: *See*—
Kaplan, Richard B.; and Gonnella, Sebastian, 4,150,905, Cl. 401-215.000.
Umetani, Tomonobu: *See*—
Nohara, Akira; Umetani, Tomonobu; and Sanno, Yasushi, 4,151,180, Cl. 260-345.200.
Umezawa, Hamao; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Separation of coformycin and its related nucleosides. 4,151,347, Cl. 536-24.000.
Unger, Stefan H.: *See*—
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,151,297, Cl. 424-304.000.
Unicler: *See*—
Vallet, Francois M. J., 4,151,291, Cl. 424-281.000.
Union Carbide Corporation: *See*—
Berger, Sidney E., 4,151,154, Cl. 260-40.00R.
Gimovsky, Arlene J., 4,151,254, Cl. 422-71.000.
Kaplan, Leonard, 4,151,192, Cl. 260-449.00L.
Park, Kisoon, 4,151,056, Cl. 204-159.160.
Stueben, Kenneth C.; Azrak, Raymond G.; and Patrylow, Michael F., 4,151,055, Cl. 204-159.150.
Thurman, Duane E., 4,151,353, Cl. 54[illegible]-159.000.
Williams, Thomas C.; and Totten, George E., 4,151,157, Cl. 260-42.150.
Union Oil Company of California: *See*—
Smith, David R., 4,151,149, Cl. 260-29.6SQ.
Woertz, Byron B., 4,151,260, Cl. 423-224.000.
Union Siderurgique du Nord et de l'Est de la France: *See*—
Dussart, Bernard, 4,150,712, Cl. 164-147.000.
Unishkov, Vadim A.: *See*—
Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and Nekljudova, administrator; by Olga V., 4,151,005, Cl. 136-89.0CC.
United Merchants and Manufacturers, Inc.: *See*—
Sackoff, Martin M.; Smith, John R.; and Walling, Billy E., 4,151,319, Cl. 428-40.000.
United States of America
Air Force: *See*—
Arnold, Fred E.; and Hedberg, Frederick L., 4,151,358, Cl. 546-98.000.
Barron, Mark B.; and Butler, Walter J., 4,151,539, Cl. 357-24.000.
Heinrich, Eric C.; and Mosley, William H., Jr., 4,151,478, Cl. 330-108.000.
Krayenbuhl, Harold A.; Dolgonas, Gene; and Rogers, Charles J., 4,150,540, Cl. 60-271.000.
Army: *See*—
Belko, Raymond P.; and Huss, Robert C., 4,150,920, Cl. 416-145.000.
Fry, Raymond R., Jr., 4,151,233, Cl. 264-3.00B.
Jasper, Louis J., Jr., 4,151,476, Cl. 330-43.000.
Konick, William L., 4,150,882, Cl. 352-39.000.
Energy: *See*—
Bell, Harold S., Jr., 4,150,759, Cl. 214-187.000.
Fitzpatrick, Gary O.; and Britt, Edward J., 4,151,438, Cl. 310-306.000.
Morris, Marvin E.; Pierce, Jim D.; and Whitfield, Willis J., 4,151,419, Cl. 250-453.000.
Welch, Kimo M., 4,151,325, Cl. 428-432.000.
Health, Education and Welfare: *See*—
Ito, Yoichiro, 4,151,089, Cl. 210-198.00C.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brooks, Richard L. Fluid sample collection and distribution system. 4,151,086, Cl. 210-108.000.
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Black, James M., 4,151,456, Cl. 323-22.00T.
Navy: *See*—
Breglia, Denis R.; Entwistle, Robert J.; Oharek, Frank J.; and Rosendahl, Gottfried R., 4,150,885, Cl. 352-130.000.
Derderian, George; and Mohon, Windell N., 4,151,411, Cl. 250-225.000.
Fenneman, David B.; and Geres, Robert J., 4,151,393, Cl. 219-121.00L.
Kaloi, Cyril M., 4,151,530, Cl. 343-700.0MS.
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Kaloi, Cyril M., 4,151,532, Cl. 343-700.0MS.
Markowitz, Alan E., 4,150,862, Cl. 339-15.000.
Stachiw, Jerry D.; and Horn, George M., 4,150,875, Cl. 350-319.000.
U.S. Philips Corporation: *See*—
Compen, Johannes M. A. A., 4,151,312, Cl. 427-64.000.
De Graaff, Hendrik C.; Hart, Paul A. H.; Schmitz, Albert; and Slotboom, Jan W., 4,151,006, Cl. 148-1.500.
de Jonge, Frederik A., 4,151,600, Cl. 365-8.000.
Gerkema, Jan; and Koel, Gerrit J., 4,151,574, Cl. 360-113.000.
Haisma, Jan; Van Mierloo, Klaas L. L.; Enz, Ulrich E.; and Bongers, Piet F., 4,151,602, Cl. 365-32.000.
Hilbrands, Hans A., 4,150,779, Cl. 229-44.00R.
Roger, Bernard, 4,151,541, Cl. 357-34.000.
Van Bokestal, Andre M. A.; and Belhomme, Charles J. G., 4,151,401, Cl. 219-508.000.
van den Boom, Petrus F. J.; and Seuter, Antonius M. J. H., 4,151,443, Cl. 313-486.000.
Verhulst, Antonius G. H., 4,151,601, Cl. 365-8.000.
United Technologies Corporation: *See*—
Walker, Bryant H.; and Bogard, Ralph B., 4,150,557, Cl. 72-354.000.
Yonescu, William E., 4,151,452, Cl. 318-605.000.
University of California, The Regents of the: *See*—
Kaplan, Donald A.; and Wilcox, Gary L., 4,151,065, Cl. 204-299.00R.
Riegelman, Sidney; and Chiou, Win L., 4,151,273, Cl. 424-78.000.
University Patents, Inc.: *See*—
Jewett, Warren R.; Theiss, John B.; and Adler, Lawrence, 4,150,670, Cl. 128-188.000.
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, to Syntex (U.S.A.) Inc. Bicyclo [3.1.0] hexyl-substituted ethylamino carbonyl phenoxy cardiovascular agents. 4,151,297, Cl. 424-304.000.

UOP Inc.: *See—*
Colton, John W., 4,150,962, Cl. 62-17.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,151,176, Cl. 260-326.270.
Bundy, Gordon L., 4,151,206, Cl. 260-590.00C.
Bundy, Gordon L.; and Nelson, Norman A., 4,151,359, Cl. 560-53.000.
Marzoli, Angelo, 4,150,531, Cl. 57-124.000.
Sih, John C., 4,151,351, Cl. 542-426.000.
Smith, Herman W., 4,151,184, Cl. 260-408.000.
Urban, George H. Battery connector clamp. 4,150,868, Cl. 339-233.000.
USM Corporation: *See—*
Chaplick, Adolph M., 4,151,155, Cl. 260-40.00R.
Skierski, Edwin J., 4,150,451, Cl. 10-9.000.
Vakuum Vulk Holdings Limited: *See—*
Schelkmann, Wilhelm; and Schelkmann, Gerda, nee Werner, 4,151,027, Cl. 156-96.000.
Valin, Jacques, to Compagnie d'Informatique Militaire, Spatiale et Aeronautique. Device for inscribing graphic and alphanumerical symbols on a recording medium. 4,151,536, Cl. 346-162.000.
Vallet, Francois M. J., to Unicler. Ethers of 7-hydroxy-coumarin useful as medicaments. 4,151,291, Cl. 424-281.000.
Valyi, Emery I. Method for the preparation of hollow plastic articles. 4,151,248, Cl. 264-513.000.
Van Bokestal, Andre M. A.; and Belhomme, Charles J. G., to U.S. Philips Corporation. PTC heating device having selectively variable temperature levels. 4,151,401, Cl. 219-508.000.
Van Coney, Robert H.: *See—*
Lucas, Malcolm B.; and Van Coney, Robert H., 4,151,240, Cl. 264-504.000.
Vandenberg, Andrew W.: *See—*
Vandenberg, Ben W.; Vandenberg, August; and Vandenberg, Andrew W., 4,150,638, Cl. 119-148.000.
Vandenberg, August: *See—*
Vandenberg, Ben W.; Vandenberg, August; and Vandenberg, Andrew W., 4,150,638, Cl. 119-148.000.
Vandenberg, Ben W.; Vandenberg, August; and Vandenberg, Andrew W. Locking stanchions for cattle. 4,150,638, Cl. 119-148.000.
van den Boom, Petrus F. J.; and Seuter, Antonius M. J. H., to U.S. Philips Corporation. Luminescent materials and discharge lamp containing the same. 4,151,443, Cl. 313-486.000.
van der Sijpt, Gerardus F.: *See—*
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and van der Sijpt, Gerardus F., 4,150,965, Cl. 71-27.000.
Van Haaften, Henry M. T. Liquid distribution device. 4,150,685, Cl. 137-119.000.
van Herpe, Francois: *See—*
De Busscher, Cyriel R. J.; Dekeyzer, Marcel A.; and van Herpe, Francois, 4,150,525, Cl. 56-14.600.
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and van der Sijpt, Gerardus F., to Compagnie Neerlandaise de l'Azote (Societe Anonyme). Ammonium nitrate containing fertilizer pellets and a process of making same having a coating of C_{12}–C_{18} alkyl amine(s) and an overcoat of mineral oil. 4,150,965, Cl. 71-27.000.
Van Mierloo, Klaas L. L.: *See—*
Haisma, Jan; Van Mierloo, Klaas L. L.; Enz, Ulrich E.; and Bongers, Piet F., 4,151,602, Cl. 365-32.000.
Varga, John F.: *See—*
Hug, Leonard F.; Uba, Toshio; Frazier, Charles; and Varga, John F., 4,151,331, Cl. 429-94.000.
Varo, Inc.: *See—*
Lipke, Donald L., 4,151,415, Cl. 250-333.000.
Vaseen, Vesper A. Producing medical grade oxygen for human, animal, or laboratory use by paramagnetic separation of oxygen from air. 4,150,956, Cl. 55-48.000.
Vasiliev, Evgeny A.; Sirotinsky, Petr S.; Ivanov, Dmitry P., deceased; and by Ivanov, Vitaly D., administrator. Method of continuous production of nodular cast iron. 4,150,979, Cl. 75-130.00R.
Vaughn, Thomas R., to Northrop Corporation. Hydraulic torquer device for floated inertial platform. 4,150,579, Cl. 74-5.00R.
Vaughn, Wade, to Norfin, Inc. Method and apparatus for applying a book cover. 4,150,453, Cl. 11-3.000.
Veal, Leo D. Welding control system. 4,151,396, Cl. 219-132.000.
Veba-Chemie Aktiengesellschaft: *See—*
Hasser, Gunter; Hubel, Werner; Nagengast, Werner; Disteldorf, Josef; and Schnurbusch, Horst, 4,151,338, Cl. 526-185.000.
Schmitt, Karl; Disteldorf, Josef; and Schmitt, Flexi, 4,151,152, Cl. 260-33.6UB.
Vega, Jose M. R.: *See—*
Nogueira, Eduardo D.; Abad, Angel L. R.; Muntadas, Manuel B.; and Vega, Jose M. R., 4,151,077, Cl. 210-21.000.
Velasco, Gonzalo: *See—*
Kaplan, Daniel; and Velasco, Gonzalo, 4,151,058, Cl. 204-192.00S.
Venzo, Dario. Apparatus for automatically cutting, rolling and dampening pastry rolls. 4,150,935, Cl. 425-305.100.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Kagerhuber, Franz; and Scheurecker, Werner, 4,150,715, Cl. 164-448.000.
Verhulst, Antonius G. H., to U.S. Philips Corporation. Magnetic domain memory device with an improved detector. 4,151,601, Cl. 365-8.000.
Verne, Michel, to Societe Anonyme DBA. Level indicator for liquid contained in a reservoir. 4,150,569, Cl. 73-302.000.
Vianini Pipes (Proprietary) Limited: *See—*
Lester, Dudley R.; and Reeves, Leslie D., 4,151,246, Cl. 264-297.000.
Vicard, Jean-Francois, to Societe Lab. Apparatus for separating solid pollutants from fluids. 4,151,091, Cl. 210-243.000.
Victor Company of Japan, Limited: *See—*
Yamamura, Takashi, 4,150,833, Cl. 274-15.00R.
Vigor, Charles W.: *See—*
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,151,435, Cl. 310-154.000.
Villa, Alvaro J., to Walt Disney Productions. Optoelectronic communications system. 4,150,824, Cl. 273-101.100.
Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Vincendon, Jean: *See—*
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Vincent, Peter I.: *See—*
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,151,224, Cl. 260-876.00R.
Violland, Robert: *See—*
Neel, Jean; and Violland, Robert, 4,150,946, Cl. 8-115.600.
Vitols, Visvaldis A.: *See—*
Riganati, John P.; and Vitols, Visvaldis A., 4,151,512, Cl. 340-146.30E.
Vlsi Technology Research Association: *See—*
Sumi, Masahiko, 4,151,421, Cl. 250-492.00A.
Takigawa, Tadahiro, 4,151,417, Cl. 250-396.00R.
Vock, Manfred H.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,151,309, Cl. 426-538.000.
Vockenhuber, Karl: *See—*
Huber, Franz, 4,150,887, Cl. 353-85.000.
Voelker, Leo O. Bird trap and cat feeder. 4,150,505, Cl. 43-69.000.
Vogel, Friedrich: *See—*
Schnepf, Dietmar; Reindl, Klaus; Gruner, Heiko; and Vogel, Friedrich, 4,151,545, Cl. 357-71.000.
Vogel, Paul W., to Lubrizol Corporation, The. Acylated polyoxyalkylene polyamines. 4,151,173, Cl. 260-326.50F.
Vogt, Russell A. Antenna mount. 4,151,533, Cl. 343-715.000.
Voigt, Wolfgang: *See—*
Fricke, Jobst; Voigt, Wolfgang; and Schmitz, Jurgen, 4,151,368, Cl. 179-1.00M.
Volk, Henry; and Lamphere, Jack C., to Dow Chemical Company, The. Process for hydrolyzing water-soluble carboxamide polymers. 4,151,140, Cl. 260-29.60H.
Volland, Hans-Guenter: *See—*
Burba, Christian; Volland, Hans-Guenter; and Esper, Norbert, 4,151,317, Cl. 427-388.00D.
von der Heide, Johann; and Papst, Georg F., to Papst-Motoren KG. Linear motor. 4,151,447, Cl. 318-135.000.
von der Neyen, Jans-Jurgen, to Siemens Aktiengesellschaft. Compensation circuit for multi-path propagation distortion in binary frequency modulated signals. 4,151,475, Cl. 329-105.000.
Votrak Information Systems, Inc.: *See—*
Root, John J., 4,151,370, Cl. 179-2.0AS.
Vukelic, Branko. Sugarcane processing equipment. 4,151,004, Cl. 127-2.000.
Vyskumny ustav mechanizacie a automatizacie: *See—*
Fulier, Jozef, 4,150,555, Cl. 72-114.000.
Vysoka skola chemicko-technologicka: *See—*
Minarik, Milan; Popl, Milan; and Mostecky, Jiri, 4,150,563, Cl. 73-61.10C.
W. H. Booth & Co., Ltd.: *See—*
Hoult, Frederick H., 4,150,704, Cl. 164-12.000.
W. R. Grace & Co.: *See—*
Kight, Jack M., 4,151,328, Cl. 428-483.000.
W. Schlafhorst & Co.: *See—*
Derichs, Josef, 4,150,530, Cl. 57-263.000.
Raasch, Hans, 4,150,534, Cl. 57-281.000.
Wacker-Chemie GmbH: *See—*
More, Anton; Riedle, Rudolf; Straussberger, Herbert; Streckel, Willi; and Muschi, Johann, 4,151,264, Cl. 423-348.000.
Wada, Masatoshi: *See—*
Moritsu, Yukikazu; Yamada, Kooji; Wada, Masatoshi; and Munemoto, Eiji, 4,150,995, Cl. 106-1.210.
Wade, James A.; and Smith, Edward D., to Cummins Engine Company, Inc. Fuel system for internal combustion engine. 4,150,651, Cl. 123-140.0FG.
Wade, Leslie E.: *See—*
Paul, James L.; Pieper, Wendell L.; and Wade, Leslie E., 4,151,209, Cl. 260-604.0HF.
Wagener, Dietrich, to Didier Engineering GmbH. Apparatus for charging inclined chamber coke oven. 4,151,045, Cl. 202-128.000.
Waggoner, Clinton A.; and Schmitz, Murdock E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. High-precision pressure. 4,151,253, Cl. 422-68.000.

Wahli, Robert: *See*—
Meyer, Armin; Muller, Jorg; Brandli, Bruno; and Wahli, Robert, 4,150,894, Cl. 355-38.000.

Wajima, Motoyo; Kawamoto, Mineo; Murakami, Kanji; Morishita, Hirosada; and Suzuki, Haruo, to Hitachi, Ltd. Method for production of printed circuits by electroless metal plating employing a solid solution of metal oxides of titanium, nickel, and antimony as a masking material. 4,151,313, Cl. 427-98.000.

Wake, Robert H.: *See*—
Richey, Joseph B.; Wake, Robert H.; Wilson, Henry H.; and Cheiky, Michael C., 4,151,416, Cl. 250-363.00S.

Wakeman, William G., to Pitney Bowes, Inc. Copying apparatus cover. 4,150,896, Cl. 355-75.000.

Wald, Milton M.: *See*—
Kim, Leo; and Wald, Milton M., 4,151,214, Cl. 260-676.00R.

Walker, Bryant H.; and Bogard, Ralph B., to United Technologies Corporation. Forging apparatus having means for radially moving blade die segments. 4,150,557, Cl. 72-354.000.

Walker Equipment & Service Co.: *See*—
Walker, Wesley F., Jr., 4,151,376, Cl. 179-81.00B.

Walker, James V., to McDonnell Douglas Corporation. Backed boss seal fitting. 4,150,836, Cl. 277-188.00A.

Walker, Wesley F., Jr., to Walker Equipment & Service Co. Amplifier for telephone handset. 4,151,376, Cl. 179-81.00B.

Walker, William H.: *See*—
Smith, Charles W., Jr.; Walker, William H.; and Zimmerman, Franz X., 4,151,400, Cl. 219-400.000.

Wallace Murray Corporation: *See*—
Bremer, Robert C., Jr., 4,150,587, Cl. 74-574.000.
Matucheski, Joseph V., 4,150,919, Cl. 416-93.00R.

Wallace, Ronald M., to Raytheon Company. Pulsed power supply. 4,151,488, Cl. 331-107.00R.

Wallenius, Jan F.: *See*—
Helgesson, Carl O.; and Wallenius, Jan F., 4,150,467, Cl. 29-26.00B.

Walling, Billy E.: *See*—
Sackoff, Martin M.; Smith, John R.; and Walling, Billy E., 4,151,319, Cl. 428-40.000.

Walt Disney Productions: *See*—
Villa, Alvaro J., 4,150,824, Cl. 273-101.100.

Walter, Leo, to Electronic Stamping Corporation. Double contact bus strip. 4,150,864, Cl. 339-19.000.

Walters, Howard G. Belt for transport of materials and transmission of power. 4,150,581, Cl. 74-238.000.

Wang, Tec T. T. Shoe with attachable and interchangeable skate accessories. 4,150,499, Cl. 36-115.000.

Wankel GmbH: *See*—
Eiermann, Dankwart, 4,150,926, Cl. 418-61.00A.

Wardman, John C. Reciprocating pump powered by solar and wind energy. 4,150,923, Cl. 417-379.000.

Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, to Roussel Uclaf. Novel racemization process. 4,151,195, Cl. 260-465.00D.

Warner, Robert L., Sr. Replaceable corner molding. 4,150,517, Cl. 52-288.000.

Warren, Ruth D.; and Warren, Stephen F. Electric fence post and insulator holder. 4,150,814, Cl. 256-10.000.

Warren, Stephen F.: *See*—
Warren, Ruth D.; and Warren, Stephen F., 4,150,814, Cl. 256-10.000.

Washbourne, Colin; and Edwards, Bryan W., to Foseco International Limited. Applicator. 4,150,849, Cl. 294-19.00R.

Washburn, Clyde: *See*—
Coleman, John R.; and Washburn, Clyde, 4,151,473, Cl. 328-134.000.

Wasserman, Moe S.: *See*—
Goldman, Ernest A.; and Wasserman, Moe S., 4,151,537, Cl. 357-23.000.

Watanabe, Akinori; Tanoshima, Katsuhide; and Noguchi, Matsusaburo, to Oki Electric Industry Co., Ltd. Ink mist type high speed printer. 4,150,620, Cl. 101-114.000.

Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, to Kokusai Electric Company, Ltd. Selective calling circuit employing controlled power supply therefor. 4,151,472, Cl. 328-75.000.

Watanabe, Hiroyuki: *See*—
Hamada, Makoto; and Watanabe, Hiroyuki, 4,150,842, Cl. 280-661.000.

Watanabe, Itaru: *See*—
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.

Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkyusho. Toy record player. 4,150,831, Cl. 274-15.00R.

Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkyusho. Mechanism for causing returning movement of tone arm of toy phonograph. 4,150,832, Cl. 274-15.00R.

Watanabe, Minoru: *See*—
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, 4,150,536, Cl. 58-23.00D.

Watanabe, Yoshihide; Kitada, Keiji; Kuratani, Osamu; and Iriuchijima, Makoto, to Maruzen Oil Co., Ltd. Powder coating composition. 4,151,220, Cl. 260-850.000.

Water Purification Associates: *See*—
Probstein, Ronald F.; and Yung, David, 4,151,084, Cl. 210-97.000.

Watson, Alan R., to Electro-Voice, Incorporated. Electrostatic microphone with damping to improve omnidirectionality, flatten frequency response, reduce wind noise. 4,151,378, Cl. 179-111.00R.

Watson, William O.: *See*—
Blomeyer, Earle B.; Watson, William O.; and Richardson, Charles T., Jr., 4,151,380, Cl. 179-148.00R.

Watt, William E. R., to Pharmachem Corporation. Coded entry system for blood bag. 4,150,673, Cl. 128-272.000.

Webb, Ronald C.: *See*—
Breining, Grant; and Webb, Ronald C., 4,150,752, Cl. 211-13.000.

Webb, Thomas E.: *See*—
Thompson, David S.; Prestley, John S., Jr.; and Webb, Thomas E., 4,151,013, Cl. 148-11.50A.

Weber, Harold J. Manual gearshift and clutch training apparatus including sensory indication for most favorable operator control. 4,150,497, Cl. 35-11.00R.

Webster, Marvin K., to Honeywell Information Systems Inc. Priority assignment apparatus for use in a memory controller. 4,151,598, Cl. 364-900.000.

Weetall, Howard H.: *See*—
Takeguchi, Milton M.; and Weetall, Howard H., 4,150,950, Cl. 23-230.00B.

Weinheimer Gummiwerke GmbH: *See*—
Wolf, Karl J., 4,150,692, Cl. 137-614.170.

Weis, Claus D., to Ciba-Geigy Corporation. Process for the production of phenylalkyl sulphones. 4,151,210, Cl. 260-607.0AR.

Weitlow, Jerry. Land plane. 4,150,726, Cl. 172-780.000.

Welch, Kimo M., to United States of America, Energy. Titanium nitride thin films for minimizing multipactoring. 4,151,325, Cl. 428-432.000.

Welch, Melvin B.: *See*—
McDaniel, Max P.; and Welch, Melvin B., 4,151,122, Cl. 252-458.000.

Welstead, William J., Jr.; and Dannenburg, Warren N., to A. H. Robins Company, Inc. Compositions and methods for treating diabetic complications. 4,151,282. Cl. 424-258.000.

Welstead, William J., Jr.; and Boswell, Robert F., Jr., to A. H. Robins Company, Inc. 1,5-Disubstituted-1,2-dihydro-2H-1,4-benzodiazepin-2-ones. 4,151,285, Cl. 424-267.000.

Wemyss, George A. Framework and sheet material building structure. 4,150,516, Cl. 52-86.000.

Wence, Ronald L.: *See*—
Moore, Eugene R.; Christianson, Thomas K.; and Wence, Ronald L., 4,151,141, Cl. 260-29.60R.

Wennberg, Peder K.; and Eastman, Mark E., to Propulsion Systems, Inc. Built-up marine propellers with adjustable pitch and axially removable blades. 4,150,921, Cl. 416-207.000.

Werner & Pfleiderer: *See*—
Loffler, Reinhard; and Possler, Harald, 4,150,595, Cl. 83-171.000.

Wescor, Inc.: *See*—
Barlow, Wayne K.; and Schimmelpfennig, Howard G., 4,150,564, Cl. 73-64.300.

West Laboratories, Inc.: *See*—
Cantor, Abraham; and Winicov, Murray W., 4,151,275, Cl. 424-80.000.

Westendorf, Thomas H.; and Knorr, Robert H. Dispensing apparatus. 4,150,766, Cl. 221-112.000.

Western Electric Company, Inc.: *See*—
Charschan, Sidney S.; and Tice, Edward S., 4,151,014, Cl. 148-13.000.
Hacker, Joseph M., 4,[illegible],365, Cl. 174-107.000.

Westinghouse Electric Corp.: *See*—
Coffta, Joseph A.; Heim, William P.; Wilsdon, Thomas A.; and Barlis, Glenn A., 4,151,384, Cl. 200-153.00R.
Isenberg, Arnold O., 4,151,060, Cl. 204-195.00S.
Seese, Daniel R.; and Regotti, Alfred A., 4,151,460, Cl. 324-52.000.
Silvestri, George J., Jr., 4,150,917, Cl. 415-168.000.
Zona, Michael R.; Ruffing, Charles R.; and Johrde, Paul S., 4,151,434, Cl. 310-71.000.

Whatley, Thomas J.; and Drennen, William M., Jr., to Comcorps Communication Corps Inc. Cineconversion machine. 4,150,883, Cl. 352-87.000.

Wheeler, James R.: *See*—
Ravizza, Raymond F.; and Wheeler, James R., 4,151,570, Cl. 360-77.000.

Wheelock, Edward A. Grooved shaft seal. 4,150,835, Cl. 277-165.000.

Whirlpool Corporation: *See*—
Johnson, Philip P.; and Dingler, Geoffrey L., 4,150,680, Cl. 134-104.000.

Whitaker, Donald E., to International Telephone and Telegraph Corporation. High impedance loop-seizing and dial pulsing circuit. 4,151,377, Cl. 179-84.00R.

White, Ralph L., Jr., to Morton-Norwich Products, Inc. 5-Phenyl-2-oxazole carboximidamides as antidepressants. 4,151,168, Cl. 260-307.00R.

Whitfield, Willis J.: *See*—
Morris, Marvin E.; Pierce, Jim D.; and Whitfield, Willis J., 4,151,419, Cl. 250-453.000.

Whitney, Douglass G.; and Martin, John K., III. Injection device and method. 4,150,672, Cl. 128-214.00F.

Whitney, John M.: *See*—
Kolbow, Donald P.; and Whitney, John M., 4,150,718, Cl. 165-12.000.

Wicki, Heirz: *See*—
Holliger, Herbert; and Wicki, Heinz, 4,150,942, Cl. 8-26.000.

Wickstrom, Kjell-Ake: *See*—
Bondpers, Per-Erik; and Wickstrom, Kjell-Ake, 4,150,475, Cl. 29-469.000.

Widmer, Walter R.; Klemenz, Hans-Jorg; and Schmid, Pierre, to Gretag Aktiengesellschaft. Data transmission system. 4,151,373, Cl. 179-15.0AF.

Wiederrich, James L.: *See*—
Roberts, Thomas E., Jr.; Wiederrich, James L.; Lill, Melvin H.; and Chang, Andrew K., 4,150,897, Cl. 356-152.000.

Wieland, Dieter. Measuring cell for the continuous determination of a liquid, especially a beverage flowing through a pipe. 4,150,560, Cl. 73-19.000.

Wieland, Howard N., Jr.; and Hammer, David H., to TRW Inc. Adhesive-applying tool. 4,150,770, Cl. 222-146.0HE.

Wiewiorowski, Edward I.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Wilkinson, Donald H., 4,151,258, Cl. 423-150.000.

Wilcox, Gary L.: *See*—
Kaplan, Donald A.; and Wilcox, Gary L., 4,151,065, Cl. 204-299.00R.

Wild, Albrecht: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,151,302, Cl. 424-317.000.
Kurmeier, Hans-Adolf; Schacht, Erich; Gante, Joachim; Orth, Dieter; Simane, Zdenek; and Wild, Albrecht, 4,151,294, Cl. 424-283.000.

Wild, Hans: *See*—
Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, 4,150,719, Cl. 165-140.000.

Wilkinson, Donald H.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Wilkinson, Donald H., 4,151,258, Cl. 423-150.000.

Willard, David F.: *See*—
Nicolini, John D.; and Willard, David F., 4,151,367, Cl. 178-69.100.

Wm. Wrigley Jr. Company: *See*—
Ream, Ronald L.; and Moore, David M., 4,151,270, Cl. 424-48.000.

Williams, Jake E.: *See*—
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,151,023, Cl. 156-62.200.

Williams, John W.: *See*—
Li, Jorge P.; and Williams, John W., 4,151,125, Cl. 252-47.500.

Williams, Larry J.; and Brhel, Alvin A., to Goodyear Tire & Rubber Company, The. Belt packaging tray. 4,150,745, Cl. 206-303.000.

Williams, Maurice A.; Horn, Robert E.; and Bronikowski, John C. Process for hydrolyzing proteinaceous derivatives of the skin. 4,151,306, Cl. 426-456.000.

Williams, Thomas C.; and Totten, George E., to Union Carbide Corporation. Polymer composite articles containing polysulfide silicon coupling agents. 4,151,157, Cl. 260-42.150.

Willis, Billy R. Vehicle alarm system. 4,151,507, Cl. 340-64.000.

Wilmot, Richard D.: *See*—
Platt, Vernon H.; and Wilmot, Richard D., 4,151,523, Cl. 343-5.0DP.

Wilsdon, Thomas A.: *See*—
Coffta, Joseph A.; Heim, William P.; Wilsdon, Thomas A.; and Barlis, Glenn A., 4,151,384, Cl. 200-153.00R.

Wilson, Henry H.: *See*—
Richey, Joseph B.; Wake, Robert H.; Wilson, Henry H.; and Cheiky, Michael C., 4,151,416, Cl. 250-363.00S.

Wilson, Larry F.: *See*—
Truesdell, Curtis A.; and Wilson, Larry F., 4,150,518, Cl. 52-804.000.

Wilson, Robert F. Golf game simulating apparatus. 4,150,825, Cl. 273-185.00B.

Winiarski, Edward J.: *See*—
Bradbury, Christopher G.; Buchan, Walter; Kropa, Gomer E.; and Winiarski, Edward J., 4,151,241, Cl. 264-142.000.

Winicov, Murray W.: *See*—
Cantor, Abraham; and Winicov, Murray W., 4,151,275, Cl. 424-80.000.

Winiczei, John. Number guard anti-theft device. 4,151,509, Cl. 340-64.000.

Winnard, James R.: *See*—
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,151,420, Cl. 250-492.00A.

Wirth, John C., Jr. Power tool theft alarm. 4,151,521, Cl. 340-568.000.

Wishman, Marvin: *See*—
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,151,023, Cl. 156-62.200.

Wistuba, Hermann: *See*—
Engelbach, Heinz; Wistuba, Hermann; Sprague, Michael J.; Sturm, Hans-Juergen; and Armbrust, Herbert, 4,151,182, Cl. 260-369.000.

Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased (by Plattner, Werner, executor); Schaumann, Wolfgang; and Stegmeier, Karlheinz, to Boehringer Mannheim GmbH. Phenoxyalkylcarboxylic acid compounds and serum-lipid and triglyceride depressing therapeutic compositions. 4,151,303, Cl. 424-319.000.

Witzke, Lothar: *See*—
Muller, Wolfgang; and Witzke, Lothar, 4,151,257, Cl. 423-24.000.

Woertz, Byron B., to Union Oil Company of California. Hydrogen sulfide abatement in geothermal steam. 4,151,260, Cl. 423-224.000.

Wolf, Harry. Fluid sampling system. 4,150,574, Cl. 73-421.50R.

Wolf, Karl J., to Weinheimer Gummiwerke GmbH. Valve for closing, throttling or regulating. 4,150,692, Cl. 137-614.170.

Wolf, Ludwig. Jr.; and Carpenter, Walter L., to Baxter Travenol Laboratories, Inc. Membrane diffusion device with integral heat exchanger and reservoir. 4,151,088, Cl. 210-180.000.

Wolff, Hans P.: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Stach, Kurt, deceased; Schaumann, Wolfgang; and Stegmeier, Karlheinz, 4,151,303, Cl. 424-319.000.

Wolfson, Harris P. Heater for hot tubs and storage tanks. 4,150,665, Cl. 126-350.00R.

Wood, John F. B.: *See*—
Hazelett, Robert W.; and Wood, John F. B., 4,150,711, Cl. 164-87.000.

Woodmansee, Donald E., to General Electric Company. Coal gasification power plant and process. 4,150,953, Cl. 48-71.000.

Woods, Lee, to Arizona Forest Supply, Inc. Circulating-air heating stove. 4,150,658, Cl. 126-63.000.

Woollvin, Geoffrey G.; and Bilogan, Mieczyslaw. Variable bandwidth pass-band filter. 4,151,474, Cl. 328-167.000.

Woolston, Allan B., to Molins Machine Company, Inc. Control system for an unwinding roll. 4,151,403, Cl. 235-92.0DN.

Wrapmatic S.p.A.: *See*—
Gentili, Vittorio, 4,150,523, Cl. 53-535.000.

Wright, Mervin E., to Donaldson Company, Inc. Pleated fluid filter. 4,151,095, Cl. 210-443.000.

Wright, Owen M., to Ofrex Group Limited. Low line tacker. 4,150,774, Cl. 227-132.000.

Wright, Paul L.: *See*—
Dester, Delbert D.; and Wright, Paul L., 4,150,857, Cl. 305-12.000.
Fox, Lawrence E.; Groff, Eugene R.; and Wright, Paul L., 4,150,858, Cl. 305-57.000.

Wristers, Harry J., to Exxon Research & Engineering Co. Titanium trichloride catalyst complex and process for the production thereof. 4,151,112, Cl. 252-429.00B.

Wu, Ching-Yong; and Swift, Harold E., to Gulf Research & Development Company. Dicyanotricyclodecane. 4,151,194, Cl. 260-464.000.

Wubbels, Bernhard: *See*—
Hirsch, Peter; Wubbels, Bernhard; and Schafer, Rolf, 4,151,389, Cl. 219-73.100.

Wurmli, Albert, to Ciba-Geigy Corporation. Sulphonated, aromatic reaction products, processes for their manufacture and their use as substances having a tanning action. 4,150,944, Cl. 94.24-.

Wurst, John W.: *See*—
Brown, Jack; Herr, John A.; Peterson, Wesley R.; and Wurst, John W., 4,150,634, Cl. 112-275.000.

Wycheck, Thomas H.: *See*—
Snyder, Clair W., Jr.; Derr, Paul B.; and Wycheck, Thomas H., 4,150,866, Cl. 339-94.00M.

Wyman, Floyd H., to Thermo Kinetics, Inc. Apparatus for removing solids from filter media. 4,151,094, Cl. 210-396.000.

Yajima, Kazuo; Kobayashi, Masaaki; Nawata, Yoshiaki; Iwasawa, Shigeo; and Takahashi, Koji, to Fujitsu Limited. Transistor. 4,151,542, Cl. 357-36.000.

Yamabe, Masaaki; and Kumai, Seisaku, to Asahi Glass Company Ltd. Process for producing polyfluorodiacyl fluoride. 4,151,200, Cl. 260-544.00F.

Yamada, Akira: *See*—
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, 4,151,111, Cl. 252-429.00B.

Yamada, Hiroshi: *See*—
Watanabe, Eiji; Onozawa, Junichi; Tanaka, Jouji; Takahashi, Takazo; Kitamura, Tsuneo; Yamada, Hiroshi; Noguchi, Hiroshi; and Ueno, Yukio, 4,151,472, Cl. 328-75.000.

Yamada, Kazuji: *See*—
Kurihara, Yasutoshi; Kosugi, Tetuo; Kagami, Teruyuki; Shimada, Satoshi; Matsuda, Yasumasa; and Yamada, Kazuji, 4,151,502, Cl. 338-2.000.

Yamada, Kazuo: *See*—
Imaizumi, Shigetake; Yamada, Kazuo; and Katsumata, Katashi, 4,150,980, Cl. 75-146.000.

Yamada, Kenji: *See*—
Nakajima, Fumio; Yamada, Kenji; Machida, Takayasu; Nomura, Yasushi; and Watanabe, Minoru, 4,150,536, Cl. 58-23.00D.

Yamada, Kooji: *See*—
Moritsu, Yukikazu; Yamada, Kooji; Wada, Masatoshi; and Munemoto, Eiji, 4,150,995, Cl. 106-1.210.

Yamakawa, Yoshio; and Fukumori, Yoshiki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Exhaust gas cleaning apparatus of an internal combustion engine. 4,150,541, Cl. 60-276.000.

Yamakoshi, Yasumichi: *See*—
Seko, Naomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Fukumoto, Mitsunobu; Kimoto, Kyoji; Watanabe, Itaru; Hane, Toshioki; and Tsushima, Sakae, 4,151,053, Cl. 204-98.000.

Yamamoto, Hiroshi; and Sato, Isuke. Sound recording and reproducing apparatus, and record containing case and recording medium. 4,151,572, Cl. 360-98.000.

Yamamoto, Shigeo: *See*—
Takayama, Chiyozo; Kato, Toshiro; Yamamoto, Shigeo; Hisada, Yoshio; Kameda, Nobuyuki; and Fujinami, Akira, 4,151,290, Cl. 424-273.00R.

Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, to Tokyo Shibaura Electric Co., Ltd. Continuous gas plasma etching apparatus. 4,151,034, Cl. 156-345.000.

Yamamoto, Yoshihiro: *See*—
Tanaka, Hiroshi; and Yamamoto, Yoshihiro, 4,150,984, Cl. 75-238.000.

Yamamura, Takashi, to Victor Company of Japan, Limited. Video/audio disc reproducing apparatus. 4,150,833, Cl. 274-15.00R.
Yamanaka, Kenichi: *See*—
Mihashi, Yutaka; Nakata, Josuke; Sogo, Toshio; and Yamanaka, Kenichi, 4,151,011, Cl. 148-1.500.
Yamashita, Sadao: *See*—
NIshikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Yamashita, Sadao, 4,151,494, Cl. 333-204.000.
Yamauchi, Yukio, to Hochiki Corporation. Count discriminating fire detection system. 4,151,522, Cl. 340-587.000.
Yamazaki, Keiji: *See*—
Ueda, Horoshi; Kawamura, Kunio; and Yamazaki, Keiji, 4,150,889, Cl. 354-37.000.
Yamazaki, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Supercharged engine having main and auxiliary combustion chambers. 4,150,545, Cl. 60-611.000.
Yan, Tsoung-Yuan; and Espenscheid, Wilton F., to Mobil Oil Corporation. Coal liquefaction process. 4,151,066, Cl. 208-8.0LE.
Yano, Naomichi; Shinohara, Kazuhiro; and Sato, Joe, to Kubota Ltd. Apparatus for molding roofing panels having a stepped portion. 4,150,933, Cl. 425-219.000.
Yavnieli, Mordechai; and Zeldov, Meir, to Amcor Ltd. Ionization device employing a grounded insulative housing member spaced from an ionization electrode. 4,151,577, Cl. 361-231.000.
Yevick, George J., to Izon Corporation. Punch duplicating process. 4,150,478, Cl. 29-527.200.
Yevick, George J., to Izon Corporation. Light amplification device. 4,150,876, Cl. 350-338.000.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Tone control circuit. 4,151,477, Cl. 330-107.000.
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, to Mitsubishi Petrochemical Company Limited. Process for preparing titanium trichloride compositions. 4,151,111, Cl. 252-429.00B.
Yonekubo, Hiroaki: *See*—
Matsumoto, Yoshihisa; Yonekubo, Hiroaki; and Hatsutori, Shoji, 4,150,788, Cl 237-8.00R.
Yonescu, William E., to United Technologies Corporation. Synchro drive. 4,151,452, Cl. 318-605.000.
Yoshida, Makoto: *See*—
Mochizuki, Yoshifumi; and Yoshida, Makoto, 4,150,537, Cl. 58-23.00R.
Yoshida, Shigeki: *See*—
Kawagai, Kenji; Yoshida, Shigeki; and Nakada, Yasuo, 4,151,546, Cl. 357-71.000.
Yoshida, Shinichi: *See*—
Yokoyama, Masuzo; Yamada, Akira; Okosi, Siyouzo; Katou, Tokuo; and Yoshida, Shinichi, 4,151,111, Cl. 252-429.00B.
Yoshida, Toru: *See*—
Sanuki, Shin-ichi; Ueda, Yuziro; Yoshida, Toru; Kume, Tomoaki; and Ikenouchi, Kosaburo, 4,150,973, Cl. 75-60.000.
Yoshihara, Ichiro; and Abe, Takeshi, to Ricoh Company, Ltd. Remote meter reading apparatus comprising interphone means. 4,151,371, Cl. 179-2.0AM.
Yoshisato, Eishin: *See*—
Ichikawa, Yataro; Yoshisato, Eishin; and Nakagawa, Koji, 4,151,204, Cl. 260-584.00R.
Yoshizawa, Iwao, to Yoshizawa Kobundo. Handy notebook for addresses. 4,150,844, Cl. 281-19.00R.
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Yoshizumi, Motohiko: *See*—
Akimoto, Yumi; Ishii, Tamotsu; Yoshizumi, Motohiko; and Haghino, Sadaaki, 4,151,432, Cl. 310-26.000.
Young, James W.; and Synek, Joseph, to Mobay Chemical Corporation. Emulsifiable liquid concentrates containing 4-amino-6-t-butyl-3-(methylthio)-1,2,4-triazin-5-one and 2-chloro-N-(2,6-diethylphenyl)-N-methoxymethylacetamide. 4,150,968, Cl. 71-93.000.
Yuasa, Tetsuo: *See*—
Goto, Eiichi; Souma, Takashi; Idesawa, Masanori; and Yuasa, Tetsuo, 4,151,422, Cl. 250-492.00A.
Yueh, Mao H.; Daravingas, George V.; Rigelhof, Fred J.; and Mueller, Herman W., to General Mills, Inc. Process for producing a fried snack food containing tempeh. 4,151,307, Cl. 426-549.000.
Yugen Kaisha Watanabe Kenkyusho: *See*—
Watanabe, Katsumi, 4,150,831, Cl. 274-15.00R.
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Yung, David: *See*—
Probstein, Ronald F.; and Yung, David, 4,151,084, Cl. 210-97.000.
Yung, Kai-Lim W., to Monsanto Company. Three-component blends of a polyamide, and a polyester and a lactam terpolymer. 4,150,674, Cl. 428-288.000.
Zadde, Vitaly V.: *See*—
Strebkov, Dmitry S.; Zadde, Vitaly V.; Unishkov, Vadim A.; Litsenko, Tatyana A.; Landsman, Arkady P., deceased; and Neklјudova, administrator; by Olga V., 4,151,005, Cl. 136-89.0CC.
Zahn, Heinrich: *See*—
Fell, Wolfgang; Zahn, Heinrich; and Gunschmann, Peter, 4,150,773, Cl. 226-196.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,151,347, Cl. 536-24.000.
Zaika, Galina F.: *See*—
Goloschapov, Nikolai M.; Sigidin, Yakov A.; Tsvetkova, Elena S.; Bilich, Ida L.; Reznik, Vladimir S.; Pashkurov, Nikolai G.; Zaika, Galina F.; and Muslinkin, Abdurakhim A., 4,151,281, Cl. 424-251.000.
Zeldov, Meir: *See*—
Yavnieli, Mordechai; and Zeldov, Meir, 4,151,577, Cl. 361-231.000.
Zenith Radio Corporation: *See*—
Merrell, Richard G., 4,151,559, Cl. 358-192.000.
Ziccarelli, Salvatore F.; and Noznick, Peter P., to Beatrice Foods Co. Method for producing a fast mixed and milled conchable candy and product thereof. 4,151,308, Cl. 426-613.000.
Ziemek, Gerhard; and Eilhardt, Bernd, to Kabel-und Metallwerke Gutenhoffnungshuette AG. Foam insulated conductor. 4,151,238, Cl. 264-45.500.
Zilli & Bellini S.r.l.: *See*—
Bellini, Giorgio, 4,150,611, Cl. 99-548.000.
Zimmerman, Franz X.: *See*—
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Zimmermann, Frank: *See*—
Albrecht, Hans P.; Friedrich, Ludwig; and Zimmermann, Frank, 4,151,277, Cl. 424-180.000.
Zimmermann & Jansen, Inc.: *See*—
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Zinchuk, Michael, to Polaroid Corporation. Apparatus and method for displaying moving film on a television receiver. 4,151,560, Cl. 358-214.000.
Zink, Hans: *See*—
Klein, Erwin; Henke, Arno; and Zink, Hans, 4,151,548, Cl. 357-82.000.
Zizlsperger, Johann: *See*—
Thielen, Gunter; Zizlsperger, Johann; Reffert, Rudi W.; Wild, Hans; and Fink, Peter, 4,150,719, Cl. 165-140.000.
Zona, Michael R.; Ruffing, Charles R.; and Johrde, Paul S., to Westinghouse Electric Corp. Casting assembly for stator coils and method. 4,151,434, Cl. 310-71.000.
Zondler, Helmut, to Ciba-Geigy Corporation. Process for the manufacture of aminoalkyl-phosponic acid esters. 4,151,229, Cl. 260-968.000.
Zuckerman, Matthew M.; and Hamer, Leslie C., to Enviro Development Co., Inc. System and apparatus for control and optimization of filtration process. 4,151,080, Cl. 210-59.000.
Zupanick, Joseph E., to Sun Oil Company. Employing a fluidic oscillator, for determining the constituent gases of a gas mixture. 4,150,561, Cl. 73-23.000.
Zuuring, Peter F., to PFZ Enterprises Inc. Skate blade support. 4,150,837, Cl. 280-11.120.
Zyliss Zysset AG: *See*—
Ackeret, Peter, 4,150,591, Cl. 81-3.430.

LIST OF REISSUE PATENTEES

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BASF Aktiengesellschaft: *See*—
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, Re. 29,976, Cl. 360-132.000.

Berriman, Robert W., to Eastman Kodak Company. Silver salt direct positive emulsion. Re. 29,974, Cl. 96-108.000.

Dennison Manufacturing Company: *See*—
Paradis, Joseph R., Re. 29,973, Cl. 140-123.600.

Eastman Kodak Company: *See*—
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Gertz, Robert: *See*—
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, Re. 29,976, Cl. 360-132.000.

Herr, John A.; and Porter, Oswald M., to Singer Company, The. Safety lockout system for sewing machines. Re. 29,972, Cl. 112-158.00R.

Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, to Sony Corporation. Magnetic recording and/or reproducing system. Re. 29,975, Cl. 358-4.000.

Narahara, Hisaaki: *See*—
Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, Re. 29,975, Cl. 358-4.000.

Paradis, Joseph R., to Dennison Manufacturing Company. Installation tool. Re. 29,973, Cl. 140-123.600.

Porter, Oswald M.: *See*—
Herr, John A.; and Porter, Oswald M., Re. 29,972, Cl. 112-158.00R.

Rotter, Gerhard: *See*—
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, Re. 29,976, Cl. 360-132.000.

Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, to BASF Aktiengesellschaft. Tape cartridge which is normally closed but is pivoted to open position when taken into use, and transport apparatus for such a cartridge. Re. 29,976, Cl. 360-132.000.

Singer Company, The: *See*—
Herr, John A.; and Porter, Oswald M., Re. 29,972, Cl. 112-158.00R.

Sony Corporation: *See*—
Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, Re. 29,975, Cl. 358-4.000.

Tsuchiya, Takao: *See*—
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Uhl, Karl: *See*—
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, Re. 29,976, Cl. 360-132.000.

Wittkamp, Heinrich: *See*—
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; Rotter, Gerhard; and Gertz, Robert, Re. 29,976, Cl. 360-132.000.

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Cully, Earl. Birch tree. 4,409, 4-24-79, Cl. 51.000.

Jorgensen, Frank. African violet. 4,411, 4-24-79, Cl. 69.000.

Ryan, John J. Impatiens plant — Osage. 4,410, 4-24-79, Cl. 68.000.

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Aktiebolaget Electrolux: *See*—
Asberg, Gustaf A., 251,668, Cl. D15-61.000.

Aladdin Industries, Incorporated: *See*—
Molloy, Michael C., 251,651, Cl. D7-38.000.
Molloy, Michael C., 251,652, Cl. D7-38.000.

Appel, Mel. Toy fortress. 251,691, 4-24-79, Cl. D21-114.000.

Asberg, Gustaf A., to Aktiebolaget Electrolux. Vacuum cleaner dust bag. 251,668, 4-24-79, Cl. D15-61.000.

Bechtel, Daniel L. Riflescope mount. 251,671, 4-24-79, Cl. D22-7.000.

Bechtel, Daniel L. Riflescope mount. 251,672, 4-24-79, Cl. D22-7.000.

Bird Lovers Products, Inc.: *See*—
Kimbrough, Pat G., III, 251,688, Cl. D30-14.000.

Bjork, Bengt, to Lindells Vagfabrik Aktiebolag. Weighing scale. 251,658, 4-24-79, Cl. D10-93.000.

Brown, Patricia A.: *See*—
Chapman, Margot L.; Brown, Patricia A.; and Kostrubala, Ingrid, 251,636, Cl. D2-301.000.

Chacon, Luis M. Seat. 251,641, 4-24-79, Cl. D6-63.000.

Chapman, Margot L.; Brown, Patricia A.; and Kostrubala, Ingrid, to Warm Hearts, Inc. Slipper. 251,636, 4-24-79, Cl. D2-301.000.

Ciani, Inc.: *See*—
Kelly, Maxine, 251,645, Cl. D6-157.000.

Citation Companies, The: *See*—
Morgan, Donald F., 251,680, Cl. D23-37.000.

Colby, Donald B., to Scott Paper Company. Ottoman. 251,639, 4-24-79, Cl. D6-36.000.

Collins, Graham E.: *See*—
Wood, Kenton E.; Hill, Alan G.; and Collins, Graham E., 251,684, Cl. D24-31.000.

Coon, Dennis C., to Honeywell Information Systems Inc. Combined table console for electronic equipment or similar article. 251,666, 4-24-79, Cl. D14-44.000.

Corona Clipper Company: *See*—
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Correct Count Company Inc.: *See*—
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Devin, Jules D.; and Sharpless, Claude J. Photographic film depository or the like. 251,649, 4-24-79, Cl. D6-188.000.

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Hiraishi, Etsuo; Sakamoto, Masakazu; and Doi, Tetsuyuki, 251,692, Cl. D18-13.000.

Donnelly Mirrors, Inc.: *See*—
Hutchinson, Richard D., Jr.; Vandenbrink, Wayne; and Stegenga, Philip D., 251,662, Cl. D12-187.000.

Dusanek, Norman. Electrostatic radiator. 251,664, 4-24-79, Cl. D14-30.000.

Ebata, Takemi; Miki, Kunishige; and Nakamura, Manao, to Matsushita Electric Industrial Co., Ltd. Tape recorder. 251,665, 4-24-79, Cl. D14-6.000.

Epperson, Charles N. Sewing caddy or the like. 251,637, 4-24-79, Cl. D3-21.000.

Ergaver, Nevenka; and Ergaver, Rayko. Hair brush. 251,638, 4-24-79, Cl. D4-35.000.

Ergaver, Rayko: *See*—
Ergaver, Nevenka; and Ergaver, Rayko, 251,638, Cl. D4-35.000.

Forman, Tracy H.; Lawida, Arthur E.; and Herskowitz, Nat H. Foldable support stand for a desk calculator or similar article. 251,643, 4-24-79, Cl. D6-85.000.

Fouts, Robert E. Terminal fitting for a tubular conduit. 251,676, 4-24-79, Cl. D23-44.000.

Gardisette International AG: *See*—
Schroeder, Peter E., 251,685, Cl. D47-6.00E.

Genc, Robert R.: *See*—
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Graviner, Leo. Holder for use with easels. 251,648, 4-24-79, Cl. D6-191.000.

Grosch, Karl A.; Moitzheim, Paul H.; Schloesser, Gert; and Hensgens, Daniel J. M., to Uniroyal GmbH. Pneumatic tire tread and buttress. 251,661, 4-24-79, Cl. D12-143.000.

Grossbard, Henry. Diamond. 251,659, 4-24-79, Cl. D11-90.000.

Heller, Louis N. Dish for microwave baking. 251,650, 4-24-79, Cl. D7-23.000.

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Hill, Alan G.: *See—*
Wood, Kenton E.; Hill, Alan G.; and Collins, Graham E., 251,684, Cl. D24-31.000.
Hindman, C. M. Combined lift-lid desk and foldable seat therefor. 251,640, 4-24-79, Cl. D6-44.000.
Hiraishi, Etsuo; Sakamoto, Masakazu; and Doi, Tetsuyuki, to Ryobi Ltd. Printing machine. 251,692, 4-24-79, Cl. D18-13.000.
Honeywell Information Systems Inc.: *See—*
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Hutchinson, Richard D., Jr.; Vandenbrink, Wayne; and Stegenga, Philip D., to Donnelly Mirrors, Inc. Combined vehicle rearview mirror and mounting bracket. 251,662, 4-24-79, Cl. D12-187.000.
Jewell, Donald K., to Restaurant Technology, Inc. Packaging container for food. 251,657, 4-24-79, Cl. D9-219.000.
Johnson, Dwight N. Fill valve. 251,677, 4-24-79, Cl. D23-19.000.
Kelly, Maxine, to Ciani, Inc. Jewelry display stand. 251,645, 4-24-79, Cl. D6-157.000.
Kimbrough, Pat G., III, to Bird Lovers Products, Inc. Bird feeder. 251,688, 4-24-79, Cl. D30-14.000.
Kostrubala, Ingrid: *See—*
Chapman, Margot L.; Brown, Patricia A.; and Kostrubala, Ingrid, 251,636, Cl. D2-301.000.
Kratz, David W. Chlorinator. 251,675, 4-24-79, Cl. D23-3.000.
Kurokawa, Masayuki, to Yamagiwa Electric Co. Ltd. Clamp type lamp. 251,686, 4-24-79, Cl. D48-20.00F.
Kurokawa, Masayuki, to Yamagiwa Electric Co. Ltd. Lamp. 251,687, 4-24-79, Cl. D48-20.00F.
Kwan, Wong M., to Well Men Industrial Company. Hand held shower head. 251,678, 4-24-79, Cl. D23-35.000.
Kwan, Wong M., to Well Men Industrial Company. Shower head. 251,679, 4-24-79, Cl. D23-35.000.
Lawida, Arthur E.: *See—*
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Lee, Arthur L. Physical therapy mobile toy. 251,690, 4-24-79, Cl. D21-63.000.
Lemcke, Harland F., to Corona Clipper Company. Digger tooth. 251,667, 4-24-79, Cl. D15-29.000.
Levine, Jack. Surgical strap or similar article. 251,682, 4-24-79, Cl. D24-64.000.
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Lindmayer, Joseph, to Solarex Corporation. Solar cell or similar article. 251,663, 4-24-79, Cl. D13-4.000.
Low, Donald S. Open hood for a gondola car. 251,660, 4-24-79, Cl. D12-43.000.
Mason, Charlotte G.: *See—*
Mason, Stanley I., Jr.; and Mason, Charlotte G., 251,653, Cl. D7-85.000.
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Mason, Stanley I., Jr.; and Mason, Charlotte G. Cooking dish. 251,654, 4-24-79, Cl. D7-85.000.
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Molloy, Michael C., to Aladdin Industries, Incorporated. Food tray. 251,652, 4-24-79, Cl. D7-38.000.
Morgan, Donald F., to Citation Companies, The. Hose nozzle. 251,680, 4-24-79, Cl. D23-37.000.
Nakamura, Manao: *See—*
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CLASSIFICATION OF PATENTS

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43.9 4,150,482
133 4,150,483
254 4,150,484

CLASS 32

15 4,150,485

CLASS 33

27 B 4,150,486
30 R 4,150,487
168 R 4,150,488
177 4,150,489
180 R 4,150,490
349 4,150,491
376 4,150,492

CLASS 34

9 4,150,493
28 4,150,494
54 4,150,495
238 4,150,496

CLASS 35

11 R 4,150,497

CLASS 36

10 4,150,498
115 4,150,499
117 4,150,500

CLASS 37

43 B 4,150,501
58 4,150,502
71 4,150,503
103 4,150,504

CLASS 43

21.2 4,150,506
69 4,150,505

CLASS 46

40 4,150,507
202 4,150,508

CLASS 48

71 4,150,953
102 A 4,150,954

CLASS 49

123 4,150,509
388 4,150,510

CLASS 51

67 4,150,511
262 A 4,150,512
281 R 4,150,513
298 4,150,514
4,150,955

CLASS 52

12 4,150,515
86 4,150,516
288 4,150,517
804 4,150,518

CLASS 53

175 4,150,519
225 4,150,520
258 4,150,521
470 4,150,522
535 4,150,523

CLASS 55

48 4,150,956
53 4,150,957
70 4,150,958
341 HM 4,150,959
385 R 4,150,961
440 4,150,960

CLASS 56

1 4,150,524
14.6 4,150,525
329 4,150,526
341 4,150,527
400.19 4,150,528

CLASS 57

6 4,150,529
124 4,150,531
263 4,150,530
4,150,532
265 4,150,533
281 4,150,534

CLASS 58

23 D 4,150,536
23 R 4,150,535
4,150,537
88 R 4,150,538

CLASS 60

39.23 4,150,539
271 4,150,540
276 4,150,541
330 4,150,542
403 4,150,543
527 4,150,544
611 4,150,545
644 4,150,546
659 4,150,547

CLASS 62

17 4,150,962
18 4,150,548
55.5 4,150,549
252 4,150,550
281 4,150,551
467 R 4,150,552

CLASS 64

22 4,150,553

CLASS 65

114 4,150,963
181 4,150,964

CLASS 66

172 E 4,150,554

CLASS 71

27 4,150,965
78 4,150,966
92 4,150,967
93 4,150,968
121 4,150,969
122 4,150,970

CLASS 72

114 4,150,555
333 4,150,556
354 4,150,557
367 4,150,558

CLASS 73

1 C 4,150,559
19 4,150,560
23 4,150,561
27 R 4,150,562
61.1 C 4,150,563
64.3 4,150,564
133 R 4,150,565
136 A 4,150,566
146 4,150,567
151 4,150,568
302 4,150,569
335 4,150,570
336.5 4,150,571
356 4,150,572
362 AR 4,150,573
421.5 R 4,150,574
422 R 4,150,575
594 4,150,576
611 4,150,577
725 4,150,578

CLASS 74

5 R 4,150,579
4,150,580
238 4,150,581
248 4,150,583
255 R 4,150,584
421 R 4,150,589
501 M 4,150,585
532 4,150,586
572 4,150,582
574 4,150,587
4,150,588
780 4,150,590

CLASS 75

10 R 4,150,971
35 4,150,972
60 4,150,973
4,150,974
101 R 4,150,975
117 4,150,976
118 P 4,150,977
126 C 4,150,978
130 R 4,150,979
146 4,150,980
170 4,150,981
173 A 4,150,982
175 A 4,150,983
238 4,150,984

CLASS 81

3.43 4,150,591
64 4,150,592

CLASS 83

42 4,150,593
91 4,150,594
171 4,150,595
380 4,150,596
471.3 4,150,597
478 4,150,598

CLASS 84

1.03 4,150,599
1.11 4,150,600
322 4,150,601
402 4,150,602

CLASS 91

50 4,150,603
216 A 4,150,604

CLASS 96

1 R 4,150,985
1.5 R 4,150,986
4,150,987
35.1 4,150,988
4,150,989
36.1 4,150,990
41 4,150,991
49 4,150,992
64 4,150,993
94 R 4,150,994
108 Re.29,974

CLASS 98

115 LH 4,150,606
115 SB 4,150,605

CLASS 99

279 4,150,607
306 4,150,608
372 4,150,609
419 4,150,610
548 4,150,611

CLASS 100

2 4,150,612
3 4,150,613
5 4,150,614
7 4,150,615
35 4,150,616
117 4,150,617
257 4,150,618

CLASS 101

93.33 4,150,619
114 4,150,620
207 4,150,621
378 4,150,622
466 4,150,623

CLASS 102

1 M 4,150,624

CLASS 104

119 4,150,625

CLASS 105

199 F 4,150,626
224 A 4,150,627
367 4,150,628

CLASS 106

1.21 4,150,995
2 4,150,996
15.05 4,150,997
44 4,150,998
73.5 4,150,999
109 4,151,000
123 TQ 4,151,002
270 4,151,001
278 4,151,003

CLASS 108

60 4,150,629
64 4,150,630

CLASS 110

186 4,150,631
342 4,150,632

CLASS 112

158 R Re.29,972
260 4,150,633
275 4,150,634

CLASS 114

61 4,150,635
230 4,150,636

CLASS 116

58 R 4,150,637

CLASS 119

148 4,150,638

CLASS 123

25 B 4,150,639
97 B 4,150,640
119 A 4,150,642
4,150,646
4,150,648
4,150,649
119 E 4,150,644
4,150,647
119 EC 4,150,641
4,150,643
4,150,645
140 FG 4,150,651
140 R 4,150,650
148 CC 4,150,652
148 E 4,150,653
179 L 4,150,654
196 AB 4,150,655

CLASS 124

74 4,150,656

CLASS 126

63 4,150,658
270 4,150,659
4,150,660
271 4,150,657
4,150,661
4,150,662
4,150,663
299 C 4,150,664
350 R 4,150,665

CLASS 127

2 4,151,004

CLASS 128

2 F 4,150,666
25 B 4,150,667
49 4,150,668
79 4,150,669
188 4,150,670
212 4,150,671
214 F 4,150,672
272 4,150,673
305 4,150,675
351 4,150,676

CLASS 131

8 R 4,150,677

CLASS 132

53 4,150,678

CLASS 134

104 4,150,679
4,150,680
172 4,150,681

CLASS 135

4 R 4,150,682

CLASS 136

89 CC 4,151,005

CLASS 137

1 4,150,683
111 4,150,684
119 4,150,685
377 4,150,686
458 4,150,687
562 4,150,688
595 4,150,689
596.13 4,150,690
614.03 4,150,691
614.17 4,150,692
625.3 4,150,693
625.47 4,150,694
625.64 4,150,695

CLASS 138

44 4,150,696
118.1 4,150,697

CLASS 139

55.1 4,150,698
370.2 4,150,699

CLASS 140

123.6 Re.29,973

CLASS 141

11 4,150,700
232 4,150,701

CLASS 148

1.5 4,151,006
4,151,007
4,151,008
4,151,009
4,151,010
4,151,011
11.5 A 4,151,013
11.5 N 4,151,012
13 4,151,014
23 4,151,015
24 4,151,016
126 4,151,017
127 4,151,018
175 4,151,019
187 4,151,020
4,151,021

CLASS 149

19.4 4,151,022

CLASS 151

22 4,150,702

CLASS 152

361 R 4,150,703

CLASS 156

62.2 4,151,023
69 4,151,024
71 4,151,025
96 4,151,027
110 MD 4,151,028
145 4,151,029
158 4,151,030
201 4,151,031
215 4,151,032
235 4,151,033
345 4,151,034
415 4,151,035
435 4,151,026
475 4,151,036
477 B 4,151,037
507 4,151,038
584 4,151,039
659 4,151,040

CLASS 164

12 4,150,704
18 4,150,705
49 4,150,706
52 4,150,707
72 4,150,708
4,150,709
82 4,150,710
87 4,150,711
147 4,150,712
237 4,150,713
440 4,150,714
448 4,150,715

CLASS 165

1 4,150,716
9.1 4,150,717
12 4,150,718
140 4,150,719
170 4,150,720

CLASS 166

53 4,150,721
251 4,150,722

CLASS 172

225 4,150,723
328 4,150,724
678 4,150,725
780 4,150,726

CLASS 173

147 4,150,727

CLASS 174

65 R 4,151,363
84 C 4,151,364
107 4,151,365
116 4,151,366

CLASS 175

374 4,150,728

CLASS 177

211 4,150,729
212 4,150,730

CLASS 178

69.1 4,151,367

CLASS 179

1 GQ 4,151,369
1 M 4,151,368
2 AM 4,151,371
2 AS 4,151,370
7.1 R 4,151,372
15 AF 4,151,373
18 ES 4,151,375
18 GF 4,151,374
81 B 4,151,376
84 R 4,151,377
111 R 4,151,378
114 R 4,151,379
148 R 4,151,380

CLASS 180

114 4,150,731

CLASS 181

213 4,150,732

CLASS 182

187 4,150,733

CLASS 187

29 R 4,150,734

CLASS 188

196 BA 4,150,735
332 4,150,736

CLASS 192

13 R 4,150,737
84 C 4,150,738
107 R 4,150,739

CLASS 194

4 C 4,150,740
79 4,150,741

CLASS 195

31 P 4,151,041
96 4,151,042
103.5 R 4,151,043

CLASS 198

459 4,150,742
460 4,150,743

CLASS 200

61.39 4,151,381
61.71 4,151,382
67 D 4,151,383
147 R 4,151,391
153 LA 4,151,385
153 R 4,151,384
303 4,151,386

CLASS 201

12 4,151,044

CLASS 202

128 4,151,045
180 4,151,046
262 4,151,047

CLASS 203

6 4,151,048

CLASS 204

1 T 4,151,049
59 R 4,151,050
86 4,151,051
95 4,151,052
98 4,151,053
129.35 4,151,054
159.15 4,151,055
159.16 4,151,056
159.17 4,151,057
192 R 4,151,059
192 S 4,151,058
195 S 4,151,060
247 4,151,061
273 4,151,062
297 W 4,151,063
298 4,151,064
299 R 4,151,065

CLASS 206

205 4,150,744
303 4,150,745
372 4,150,746
603 4,150,747
624 4,150,748

CLASS 208

8 LE 4,151,066
11 LE 4,151,067
4,151,068
33 4,151,069
59 4,151,070
135 4,151,071
182 4,151,072
340 4,151,073

CLASS 209

44 4,151,074
437 4,150,749
664 4,150,750
682 4,150,751

CLASS 210

7 4,151,075
21 4,151,076
4,151,077
30 A 4,151,078
32 4,151,079
59 4,151,080
83 4,151,081
4,151,082
84 4,151,083
97 4,151,084
101 4,151,085
108 4,151,086
109 4,151,087
180 4,151,088
198 C 4,151,089
222 4,151,090
243 4,151,091
256 4,151,092
386 4,151,093
396 4,151,094
443 4,151,095

CLASS 211

13 4,150,752
105.1 4,150,753

CLASS 212

8 R 4,150,754

CLASS 214

187 4,150,759

CLASS 215

213 4,150,760
228 4,150,761

CLASS 219

10.49 R 4,151,387
69 C 4,151,388
73.1 4,151,389
118 4,151,392
121 L 4,151,393
124.10 4,151,390
124.34 4,151,394
125.12 4,151,395
132 4,151,396
216 4,151,397
374 4,151,398
385 4,151,399
400 4,151,400
508 4,151,401

CLASS 220

19 4,150,762
90 4,150,763
263 4,150,764
269 4,150,765

CLASS 221

112 4,150,766

CLASS 222

23 4,150,767
89 4,150,768
137 4,150,769
146 HE 4,150,770
400.7 4,150,771

CLASS 226

90 4,150,772
196 4,150,773

CLASS 227

132 4,150,774

CLASS 228

50 4,150,775
194 4,150,776

CLASS 229

2.5 R 4,150,777
17 R 4,150,778
44 R 4,150,779

CLASS 232

35 4,150,780

CLASS 235

92 DN 4,151,403
92 GA 4,151,404
92 PK 4,151,402
382 4,150,781
4,151,405
455 4,150,782
458 4,150,783
479 4,150,784

CLASS 236

49 4,150,785
91 A 4,150,786

CLASS 237

1 A 4,150,787
8 R 4,150,788

CLASS 238

10 E 4,150,789
83 4,150,790
282 4,150,791
349 4,150,792

CLASS 239

532 4,150,793
596 4,150,794

CLASS 241

33 4,150,795
101.1 4,150,796

CLASS 242

67.1 R 4,150,797
100.1 4,150,798
107.4 A 4,150,799
131 4,150,800
158 R 4,150,801

CLASS 244

54 4,150,802
122 R 4,150,805
135 A 4,150,803
153 R 4,150,804

CLASS 248

154 4,150,806
452 4,150,807

CLASS 249

111 4,150,808

CLASS 250

199 4,151,407
203 R 4,151,408
212 4,151,409
223 R 4,151,410
225 4,151,411
270 4,151,413
281 4,151,414
328 4,151,412
333 4,151,415
363 S 4,151,416
396 R 4,151,417
442 4,151,418
453 4,151,419
492 A 4,151,420
4,151,421
4,151,422

CLASS 251

149.4 4,150,809
309 4,150,810
315 4,150,811

CLASS 252

8.5 A 4,151,096
8.55 C 4,151,098
8.6 4,151,097
32.7 E 4,151,099
42.7 4,151,100
47.5 4,151,125
49.6 4,151,101
56 R 4,151,102
89 R 4,151,103
99 4,151,104
145 4,151,105
186 4,151,106
373 4,151,107
408 4,151,108
428 4,151,109
429 B 4,151,111
4,151,112
429 C 4,151,110
429 R 4,151,113
430 4,151,114
434 4,151,115
435 4,151,116
437 4,151,117
439 4,151,118
455 Z 4,151,119
4,151,120
4,151,121
458 4,151,122
462 4,151,123
474 4,151,124
508 4,151,126
542 4,151,127

CLASS 254

86 H 4,150,813
190 R 4,150,812

CLASS 256

10 4,150,814

CLASS 260

17 A 4,151,128
17.4 BB 4,151,129
17.4 GC 4,151,130
19 EP 4,151,131
23 H 4,151,133
4,151,134
4,151,136
23 R 4,151,135
23 XA 4,151,132
23.5 A 4,151,137
28.5 AV 4,151,138
29.2 EP 4,151,139
29.6 H 4,151,140
29.6 R 4,151,141
4,151,142
29.6 RB 4,151,148
29.6 RW 4,151,143
4,151,341
29.6 S 4,151,145
29.6 SQ 4,151,149
29.6 T 4,151,146
4,151,147
29.6 WB 4,151,144
29.7 R 4,151,150
30.4 N 4,151,151
33.6 UB 4,151,152
37 N 4,151,153
37 SB 4,151,156
40 R 4,151,154
4,151,155
42.15 4,151,157
42.26 4,151,158
42.46 4,151,159
97.6 4,151,160
118 4,151,161
158 4,151,162
239.7 4,151,163
239.95 4,151,164
306.7 T 4,151,166
306.8 D 4,151,167
307 R 4,151,168
308 R 4,151,169
323 4,151,170
326.13 R 4,151,174
326.2 4,151,172
326.26 4,151,175
326.27 4,151,176
326.5 E 4,151,171
326.5 F 4,151,173
340.9 R 4,151,177
343.7 4,151,178
345.2 4,151,179
4,151,180
345.8 R 4,151,181
369 4,151,182
396 R 4,151,183
408 4,151,184
429 R 4,151,185
429.7 4,151,187
440 4,151,188
448 C 4,151,189
449 L 4,151,192
449 M 4,151,191
449 R 4,151,190
453 P 4,151,193
464 4,151,194
465 D 4,151,195
465 F 4,151,196
465.8 D 4,151,197
501.11 4,151,198
544 F 4,151,200
562 A 4,151,201
567.6 R 4,151,202
582 4,151,203
584 R 4,151,204
590 C 4,151,206
590 R 4,151,205
600 A 4,151,207
601 R 4,151,208
604 HF 4,151,209
607 AR 4,151,210
609 F 4,151,211
659 A 4,151,212
669 R 4,151,213
676 R 4,151,214
677 XA 4,151,215
683 PD 4,151,216
683 R 4,151,217
836 4,151,218
4,151,219
850 4,151,220
857 G 4,151,222
857 PE 4,151,221
873 4,151,223
876 R 4,151,224
878 R 4,151,225
881 4,151,226
885 4,151,227
898 4,151,228
968 4,151,229

CLASS 261

25 4,151,230
91 4,151,231
114 R 4,151,232

CLASS 264

3 B 4,151,233
13 4,151,234
4,151,235
39 4,151,236
40.7 4,151,237
45.5 4,151,238
46.6 4,151,239
142 4,151,241
177 R 4,151,242
219 4,151,243
228 4,151,244
288 4,151,245
297 4,151,246
328 4,151,247
504 4,151,240
513 4,151,248
520 4,151,249
532 4,151,250
557 4,151,251

CLASS 266

57 4,150,815
106 4,150,816
139 4,150,817
193 4,150,818

CLASS 267

136 4,150,819

CLASS 269

429.3 4,151,186

CLASS 272

86 4,150,820

CLASS 273

29 A 4,150,821
63 B 4,150,822
94 R 4,150,823
101.1 4,150,824
185 B 4,150,825
218 4,150,826
256 4,150,827
260 4,150,828
265 4,150,829
4,150,830

CLASS 274

15 R 4,150,831
4,150,832
4,150,833

CLASS 277

88 4,150,834
165 4,150,835
188 A 4,150,836

CLASS 280

11.12 4,150,837
87.04 A 4,150,838
429 4,150,840
446 R 4,150,841
661 4,150,842
744 4,150,843
771 4,150,839

CLASS 281

19 R 4,150,844

CLASS 285

81 4,150,845
87 4,150,846
93 4,150,847
238 4,150,848

CLASS 290

42 4,151,423
54 4,151,424

CLASS 294

19 R 4,150,849

CLASS 296

137 A 4,150,850

CLASS 297

195 4,150,851

CLASS 299

18 4,150,852
4,150,853

CLASS 301

58 4,150,854

CLASS 303

22 R 4,150,855

CLASS 305

11 4,150,856
12 4,150,857
57 4,150,858

CLASS 307

130 4,151,425
141 4,151,426
252 UA 4,151,427
328 4,151,428
355 4,151,429

CLASS 308

23.5 4,150,859

CLASS 310

12 4,151,431
26 4,151,432
54 4,151,433
71 4,151,434
90 4,151,430
154 4,151,435
215 4,151,436
306 4,151,438
337 4,151,437

CLASS 312

184 4,150,860
266 4,150,861

CLASS 313

318 4,151,439
340 4,151,440
446 4,151,441
467 4,151,442
486 4,151,443

CLASS 315

1 4,151,444
92 4,151,445
241 R 4,151,446

CLASS 318

135 4,151,447
138 4,151,448
4,151,449
317 4,151,450
568 4,151,451
605 4,151,452
762 4,151,453

CLASS 320

48 4,151,454

CLASS 322

4,151,455

CLASS 323

22 T 4,151,456

CLASS 324

6 4,151,457
9 4,151,458
52 4,151,459
4,151,460
54 4,151,461
72.5 4,151,462
82 4,151,463
103 P 4,151,464
158 P 4,151,465
166 4,151,466

CLASS 325

15 4,151,467
4,151,468
38 R 4,151,469
311 4,151,470
473 4,151,471

CLASS 328

75 4,151,472
134 4,151,473
167 4,151,474

CLASS 329

105 4,151,475

CLASS 330

43 4,151,476
107 4,151,477
108 4,151,478
264 4,151,479
277 4,151,480
279 4,151,481
308 4,151,482
4,151,483
4,151,484

CLASS 331

1 A 4,151,485
94.5 C 4,151,487
94.5 P 4,151,486
107 R 4,151,488

CLASS 333

16 4,151,490
18 4,151,491
103 4,151,489
191 4,151,492
204 4,151,494
216 4,151,493

CLASS 335

26 4,151,495
140 4,151,496
213 4,151,497
216 4,151,498

272 4,151,499

CLASS 336

185 4,151,500

CLASS 337

89 4,151,501

CLASS 338

2 4,151,502
14 4,151,503

CLASS 339

15 4,150,862
17 LC 4,150,863
19 4,150,864
26 4,150,865
94 M 4,150,866
97 P 4,150,867
233 4,150,868

CLASS 340

15.5 MC 4,151,504
52 D 4,151,505
63 4,151,506
64 4,151,507
4,151,508
4,151,509
146.1 AL 4,151,510
146.2 4,151,511
146.3 E 4,151,512
206 4,151,513
286 R 4,151,514
309.1 4,151,515
347 C 4,151,517
4,151,518
347 CC 4,151,516
517 4,151,519
528 4,151,520
568 4,151,521
587 4,151,522

CLASS 343

5 DP 4,151,523
6.5 R 4,151,524
4,151,525
7 VM 4,151,526
7.5 4,151,527
103 4,151,528
106 D 4,151,529
700 MS 4,151,530
4,151,531
4,151,532
715 4,151,533
883 4,151,534

CLASS 346

139 C 4,151,535
162 4,151,536

CLASS 350

61 4,150,869
96.16 4,150,870
175 ML 4,150,871
214 4,150,872
292 4,150,874
319 4,150,875
338 4,150,876
341 4,150,877

344 4,150,878
357 4,150,879
358 4,150,880

CLASS 352

27 4,150,881
39 4,150,882
87 4,150,883
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4,151,547
4,151,603
53 : 4,150,453
4,150,627
4,150,723
4,150,800
4,150,921
4,151,439
54 : 4,151,056
4,151,192
55 : 4,150,457
4,150,470
4,150,519
4,150,584
4,150,733
4,150,777
4,150,808
4,151,130
4,151,293

DESIGN PATENTS

6 : 251,667
251,676
251,677
06 : 251,639
251,650
251,664
251,681
251,683

09 : 251,653
251,654
11 : 251,647
12 : 251,674
13 : 251,695
17 : 251,636
251,657
251,670

24 : 251,648
251,663
251,690
25 : 251,642
251,666
26 : 251,656
251,662
251,680

29 : 251,675
251,688
34 : 251,643
251,684
251,691
36 : 251,645
251,659

251,682
251,689
251,693
251,694
40 : 251,637
47 : 251,651
251,652

48 : 251,640
251,646
251,649
251,655
251,671
251,672
51 : 251,673

PLANT PATENTS

06 : 4,410

17 : 4,409

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